

# METACOMPILER

The image is a digital art piece featuring a woman's silhouette in the center, standing on a reflective surface. She is looking towards a city skyline at night, which is partially obscured by a heavy digital rain of binary code (0s and 1s) falling from the top. The scene is lit with vibrant blue and orange light trails, creating a sense of motion and data flow. The overall aesthetic is high-tech and cybernetic.

**MICHAEL BARR**

# METACOMPILER

Michael Barr

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• Lexus  
• " " .  
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• , NSA, , .  
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• : **1970**  
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• , , . NSA . .  
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• : . FDA  
• : NSA. .  
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METACOMPILER Daniel Suarez, A.G. Riddle, Marc Elsberg —  
• , .

METACOMPILER:

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· · ·  
· · · · ·  
( ) . (NSA, FDA, GRU),  
·

AI : AI . Michael Barr , , ,  
. AI (Anthropic Claude) .

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— 2026 03 08

ISBN:

Idle Task Press



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David 1 .

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: , , , , Starfire Pearl

Lexus ES 350 .

1,744,111 . ( ) . , , .

Mother .

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7 , 1

. 75.3, David Dershon

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. . David , Cabrillo Hwy

. 1.02 ,

23.4 ,

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. , . Kali

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. Kali , .

Kali David , .

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. Lexus .

David .

. . : 62, 66, 71.

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77, 83.

San Lorenzo . David : .

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Lexus .

, Chevy Silverado .

Silverado " "

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Lexus San Lorenzo 33 ,

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David . 300

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David . A-

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Lexus .

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David .

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. compiler , 1970 ,

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*METACOMPILER*

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Silverado 2 47 911 . 3 9 .  
4 52 . CHP .  
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David Dershon . 2026 Lexus ES 350  
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# 1: Liya

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— . Kaliya Devi

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— cochlear implant — .

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. . . . .

. . . . . WiFi router

. . . . . 60 —

. . . . . , implant ,

. . . . .

David , treadmill .

. . . . .

Santa Cruz . . . . .

Kali . . . . . HOA .

. . . . .

2 . Nest , Ring , Samsung .

. . . . . 2003 —Craigslist .

treadmill .

. . . . . Precor , haptic

. . . . .

mesh . . . . .

. . . . . David

. . . . . cochlear implant override ,

. . . . . treadmill . ,

, . . . .

. . . . . 8 7, 6 30 .

— . Kali

. . David , .  
, , .

David. . , . ,  
Gunn .  
— NSA . , WebU ,  
Tesla . ,  
David . . . . .

Kali , David . Palo Alto . .  
. Ajji Liya —implant , , Kali  
. David  
, Kali . , , .

. , — .  
, David

. . , . "" ,  
.

David. . CalTech ,  
Santa Cruz . . .  
. . SF , ( ,  
, ) . Kali . ,  
, . . .

9 — 162, treadmill 7.3 — .

. . — .  
. . , .  
treadmill cochlear implant .

. David . , , .

treadmill . . override —cochlear  
override implant . ,  
, . —  
. — , . treadmill  
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"Kaliya Devi ?" . implant . Kali cochlear  
50 override . —

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" CHP Santa Cruz Elaine Padilla . David Dershon ."

Kali . .

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", Dershon San Lorenzo River Highway 1  
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Kali . . .  
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60 — .  
, , Kali .  
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" ?"  
"2026 Lexus ES 350, —"  
" . ." . . .  
Kali . , , .  
, . . . .  
" ?"  
"Highway 1 , San Lorenzo River ."  
" —"  
" , . . —"  
" ?"  
. " . Chevy Silverado. Lexus  
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" . ."  
". "  
Kali . implant — ,  
. , — ,  
, Loma Prieta . David  
. David . 2026 Lexus ES 350  
. . .  
. . . brake-by-wire. CAN bus 14  
. . . .  
David . . 3 . . .  
Highway 17 70 .  
, , 10 .  
", " .

, David — ,  
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Kali ,  
—, —.  
, cochlear implant  
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## 2:

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Kali . . . ,

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— . David . David

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Palo Alto, 1993. Waverley Street Murphy Oil Soap,

. Kali ,

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. . . , Bangalore Aiji Kali

. . . , Kali

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Priya. San Jose State . . . .  
Shakuntala Devi ' ' , 1970 80  
. Aiji 13 28 . Imperial College London  
, Univac 1108 .

Kali . , . ,  
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Kali . , . , Kali  
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, , . . , David .  
" ?" , , David . .  
. . . . " . " . Kali ,

. . . .  
, Kali 486 PC . . 2.

. . . .  
text-to-speech . . 80 ,

. . . . , .  
. Kali . . (crash) .

. , , . Kali

. , , .  
. Kali , , . . .

. 6 ,  
. . . . Priya Devi Mountain View

11 . , . ,

" . . ." David .

Kali . . . .

13 .

. . . , 22 ,  
. Kali .  
, . . .  
. 10 .  
. . . 12  
. . . . Kali .  
. , . .  
. . . .  
, , . . , .  
. . . David  
. .  
. EM . . ,  
, , . .  
. 6 firmware , 30 ,  
. . .  
. . . .  
. David . De Anza College ,  
. . . GPS 2003 Honda Civic.  
. . . . DMV  
. , . .  
. . . .  
. , Kali .  
. . . . .  
, . C K&R .  
Intel . device driver .  
firmware . . . ,  
. .  
. , C (IOCCC) . IOCCC  
. . . . ,  
compiler . Kali 487 .  
- , . .  
. . . .  
. . . .  
. . . . TCP/IP .  
. 3 ,  
. . . . ,  
, . . .  
. David (David ) . David .  
, . . . . Ajji Bangalore  
, , . Kali . . .

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. . . .

2002 , Kali , (NSA)  
Waverley Street Devi . , Dr.  
Devi , , , 9.11

Kali . . . T-Mobile  
BlackBerry. Kali suite . .

. Maryland Meera . Meera masala dosa .  
6 Fort Meade

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. , . . . .  
. — , , —  
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. . . .

. Kali . . .  
. . . , WiFi,

David . David . David

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. Kali .

### 3:

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Kali 4,800 , (NIST)  
578 — —

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Dr. Steven Foster 13 0547 .7 ,

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. , Steve

. Poseidon Se7en+  
. 40 40 .  
. . Steve Foster .

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. BUD/S , 22  
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. — — ,

(MAD) , . NIST

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40 .

NIST , . Steve ,  
SEAL , FDA . White Oak  
NIST . . .  
Steve 40 .

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15 , 25 . Steve

5 . . . . ,

Steve . . "" , "" . . . .

BUD/S 2 ,

. Steve . 22 ,

. . . . 38 —

, 40 , , Steve

Foster HUD .

. 0611. . . .

FDA .

CDRH , FDA MAUDE 14

FDA

Steve HUD . . . .

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. : 7 , 7 , 7

. 2021 . 2022 . 2023 .

2024 . : , , , , , ,

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. , , Steve

. SEAL HUD 40 .

0624 . . . .

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NIST .

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. . , firmware , , .  
— , , .

firmware . . . 7  
24 . . . 7 Steve

MedStar Georgetown , .

Steve . . . , , . 3

. . , Clinton HP LaserJet,

6 — — .

. . . 7 .  
— , , . 3

Steve , . . . , ,

. . Steve Foster , .

, BUD/S

. . , 0900, CDRH , White Oak . Deputy Director Okafor

. Steve 6 . ":

(Foster) . . ."

. . . Steve Foster

Deputy Director Okafor

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—  
Maker's Mark ,  
— Maximillian Dershon Sacramento .

San Mateo -- , ,  
Max ,  
. 101 , 80 .  
, Max . 1994 Ford Ranger 22 7  
, 2 3 , AM . . .  
. . . .

CHP Golden Gate Division Richards Boulevard , .  
, , . Max , --  
, . . .

Division Chief Gardner . . . , ,  
. Gardner Max . . .  
, . . .

"Max. ."  
. Max . Gardner ,  
.

"John, ."  
Gardner . . . Max  
. . . .

" . Sanderson MAIT . Golden Gate Division ,  
. . . . ,  
. . . ."

Gardner . Max . . .  
"Sanderson . . . , , —  
David . . . , .

. " Max . " Lexus ? ?"  
Gardner . "Max. . . .  
. — David , , --"

" , John. . . .  
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" . . . — ,

, --"  
 "David . . . — , . . .  
 . . ."  
 Gardner . . . " event data recorder . . .  
 . . . EDR  
 fault code, , . Toyota  
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 " , John. 83. 100 . .  
 . ' ' . ."  
 Gardner Max . Max 850 Bryant Street  
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 "Max. . . . ."  
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 Gardner . . Max . .  
 . : . .  
 " , Max."

Max CHP Ranger . . , David  
 . . . .  
 San Mateo . . Ranger 1 . Max  
 , " " . .  
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 Marie. 23 . . , ,  
 . . . 1986 Balboa Street ,  
 Palo Alto . . IT  
 . David , Max . . ,  
 . . . .  
 . . . . David  
 2 , Max  
 . . . .  
 Max . SFPD, 1984. , San Francisco State  
 , . . . .  
 — IBM System/36, , 850 Bryant Street  
 . . Max . Richmond District  
 Commodore 64 BASIC , Pascal, C, .

. dBASE III ,  
. . . . . 2  
11 , Weisberg Max .  
14. . Max ,  
. . . . .  
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. . . . . Max .  
( , , ) .  
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. . . . .  
David . , 6 , Max , Max  
, Max . David  
. David Santa Cruz Giants ,  
"" . David  
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David , . Max  
, David Santa Cruz .  
Foundation 112 . David  
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. . . . .

. Max . ,  
. . . . . Maker's Mark . Holiday Inn  
. . . . .  
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. . . . .  
. . . . . Max ,  
. . . . .  
CHP . . . EDR . . . . .  
: , , Lexus. San Lorenzo , .  
. 1: , .  
2: , Lexus  
. 3.

Max .  
3 Wyoming Chevrolet Silverado 2500 HD . Cody , Harold  
Pettit . Pettit Lexus 200 .

. Lexus , ,  
("14, "), ,  
(" "), Lexus .  
...  
" " , Harold Pettit .  
Lexus , , .  
Max . . CHP . . .  
. , , .  
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Max . , , ,  
. 1994 . 850 Bryant Street  
14 . — —  
. .  
Maker's Mark . . . . 30  
, . .  
. .  
— , Redwood City .  
. .  
"Wyoming, Cody. Harold Pettit. P-E-T-T-I-T."  
. Max . . Pettit  
. CHP . . CHP  
, Max  
. .  
. . Lexus .  
, Maximillian Dershon .

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# 5: 20

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Jessica Swinton WebU 5 ,

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" , " . " 2 33, 20  
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Mitchell Allen Beach IV . 9 20

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, 3 1 , WebU 15

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Beach , . Mitchell  
Allen Beach IV . , , .

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4 . Beach

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Beach .

20 . . , Jessica  
. Beach . 20 , ,

. ( 10 ) 10 .  
... , Beach

CDN . CDN

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. . WebU 3

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Jessica . . . Beach .

, .

" , " Jessica . "13 80  
 , 85 WebU . 10  
 . , , . 4 1 ,  
 3 ."

. Sheng . Bei Sheng — Beach Stanford , WebU 30 .  
 , Beach .  
 Sheng ,  
 . , . Sheng  
 . Beach . WebU Facebook  
 . .

" , " Jessica . " , 25,  
 5 1 . ,  
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 2041. . Beach ,

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 . 20 , , . Beach  
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 WebU .

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 CDN . . — 20  
 6 47 —  
 2012 , Beach 4

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 Kali WebU , . Palo Alto Beach 20  
 . , — —  
 . Beach . .  
 — , Beach 30 . .

. . ,  
 , . .  
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 . Kali Beach .  
 10 . ,

. . .  
 Jobs Wozniak . , Beach . ,  
 . Wozniak . Kali .  
 . , 2 1 .  
 Beach 1 70 . Kali .  
 . , ,

Beach Kali 3 . . . ,  
Santa  
Cruz , Beach .

. 14 —  
— . CTO .  
"Kali . 3 10 . Kali ."

Jessica . Beach , ,  
. Beach . . .

— , 5 ,

: Kaliya Devi.

3 . . . 12 Palo Alto . 2019 .

Beach . . . 3 , Los Gatos

. 40 . 200 .  
. . . David . —  
David , Beach —

David. . . CalTech . Beach Kali

, David . Kali  
. David . David , ,  
. Beach . , .

Kali . . .  
. Beach , WebU

, FBI Carla Oguendo .

"Carla. ."

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"Kali Devi."

. " ?"

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. WebU 20 .  
, Lexus 23 ,  
. .  
Beach .  
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6:

Harold Pettit . Max . ,

"Pettit , Max Dershon . . 7 Santa Cruz 1  
CHP . Lexus ."

. . Max .

" , Dershon ." , ."

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" , Pettit . . . ."

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Max . " ."

" , , .

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. . . ."

Max . . . .

— , , . . . .

" , Pettit ."

Harold Pettit . Wyoming Cody .

Silverado Silverado , Wyoming

. Monterey Cabrillo

. Lexus . " ."

. . . ."

Max . CHP . . . .

" . . . .

. . . . --, 1

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" ? ?"

" . 1, 2. -- — . .

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"14 ."

" . . . . .  
. . , Dershon . . ,  
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Max . . . . Lake Tahoe . . . .  
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"Pettit , — ?"

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" , ? ?"

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. . . . ,  
. . Lexus . . . — —  
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" , Pettit ."

" , Dershon . . . . .  
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Max Pettit 30 . . . .  
. . . . , San Mateo  
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. . . . . 1 . . . .  
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Max . . . . CHP  
. 14 , . . . .

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Santa Cruz . 101 , 17 ,  
Ranger 1 30 . 1 , Los Gatos  
. . . . 3

Max . . . .

CHP . . . . ,  
. . . . .  
. . . . .  
. Max . . . . .

. . .  
 , Lexus .  
. , , . San Lorenzo 7  
. . .  
Lexus . . . .  
30.30 117, 120.  
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. . . 5 5 .  
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Lexus . 300 . 7  
( , 200 Pettit Silverado ), .  
. . . .  
Max CHP . . . Lexus  
83 . 97 . Max  
. 120. 97 1 142 . Lexus  
1 .  
. 83 97 . ,  
, , 14 .  
. ( , ) ,  
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Pettit . , .  
Max . . . .  
. . . .  
. David . . . .  
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Ranger , Max Gilroy  
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Max . . . ,  
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: . CHP .  
. . , , Wyoming  
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. .  
. EDR CAN bus  
. .  
. , , Palo Alto California Avenue .  
CAN bus . Max . David  
Kali, Max . . . 6  
. . Max .  
. .  
. , Wyoming Cody , San Mateo  
Maker's Mark , CHP . Max Dershon  
. .  
Ranger . . . Cabrillo .  
. .  
Max , .

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## 7: Kali

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David 1 . manila  
, Kali .

. Toyota Lexus  
— David .  
( ), (CHP ),

. . . ,  
VPN . Toyota . .  
. . . Kali .

9 CHP : , , .

. — 147 ,  
. Kali .

. EDR . . . . : ,  
, Lexus.

. . . Lexus  
. Wyoming Harold Pettit — Chevrolet Silverado  
, Lexus . Pettit  
. :

Lexus — , — .

. — CAN bus

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. . Kali .

Toyota .

CHP EDR . Kali .

— Toyota , ,  
, GPS , . EDR :  
30.

Toyota Kali . Toyota  
, . , Fort Meade,

— — .

node, , .  
EDR . 40 . readings  
: , , , , , — Kali  
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. — .  
. .  
14:42:37.114, 27% — 100  
David . 14:42:37.127, 13 , 100% . .  
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200 400 ,  
: , , . Kali .  
. . . : 0xFF  
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0xFF . . . . .  
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Kali . . . . .  
— , , . .  
. . : , , . .  
David . .  
. . 14:42:36.431 —  
696 . . . , ,  
. . . CAN bus —  
, , , , , . ECU  
. . . . .  
. Pettit . Kali EDR :  
, 150 —  
, . . . . .  
CAN bus firmware  
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— . . . . . 0.5 .  
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Kali . . . . . — , ,  
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Kali .  
 . Kali ,  
 . Fort Meade, 2002 . .  
 — , PLC, , . . :  
, , , . Kali ,  
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 — , , —  
 . . . . .  
 . . . . .  
 . compiler .  
 . Aldrich — GS-15 —  
 " " . . .  
 3 , . . .  
 . . . compiler .  
 . , 16 . Aldrich . 4  
 . , ,  
 . . . . .  
 NSA . Kali .  
 . . . . .  
 compiler.  
 Santa Cruz Mountains David EDR . David  
 .  
 . . . POKE.  
 ECU — , 3 —  
 . INFO.  
 — ECU firmware , ,  
 — . PEEK.  
 INFO. PEEK. POKE. 2002 Fort Meade . Aldrich .  
 .  
 Kali . firmware — , NSA ,  
 firmware . . . . . ISR(  
) , — .  
 . . . . .  
 . — ,  
 compiler .  
 backdoor .  
 compiler . . . compiler  
 compiler compiler , C —  
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 Kali . . . . .

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. . . , , .  
. , , 3 .

David .

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# 8:

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. . . Santa Cruz Mountains

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. . .

1984, Ken Thompson San Francisco .

Turing Award . , New Jersey Murray Hill Bell

Telephone Laboratories Dennis Ritchie Unix . Unix

C, 1984 . ,

, , , . Thompson .

, .

"Reflections on Trusting Trust". . Communications  
of the ACM . . , Ken Thompson

David Dershon , .

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: compiler compiler .

, compiler . .

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Thompson ,

. C compiler , . , ,

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. . compiler

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Thompson 1974 Multics .

Multics Unix . . Thompson compiler

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National Security Agency .

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 1970 , C Unix Bell Labs , , NSA  
 . C compiler, ,  
 . . . . . C  
 , .  
 . compiler , (ISR)  
 . ,  
 . , Thompson compiler compiler  
 . 1972 New Jersey , .  
 NSA . . . , Fort  
 Meade . . , .  
 , (God-mode) . , .

. . . .

.  
 , ,  
 backdoor .  
 . MESM 1948 Kiev  
 Sergei Lebedev . 1953 BESM-1 . . ,  
 . 1960 , .  
 . . DEC  
 PDP-11, IBM , Intel , Unix .  
 1980 , Kiev DEC PDP-11 ,  
 . .  
 , , ,  
 compiler . Compiler .  
 . . ,  
 . GRU() .  
 . 1988 1991 ,  
 . . Elbrus CPU Vladimir Pentkovski Intel  
 Pentium . . . .  
 GRU .  
 — , — Bo  
 Kiev .

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:  
 , INFO, PEEK, POKE . INFO  
 . PEEK , firmware, , .  
 PEEK , . Shazam  
 , .  
 . 2026 .

POKE . , POKE  
 . — David , .  
 . , , ,  
 — .

, . Bell Labs C compiler .  
 . Backdoor ,  
 . . compiler  
 , backdoor .

. . . .

. . NSA, Kiev , Bo .  
 . . Backdoor compiler  
 , , David .  
 Kali . David . .  
 EDR 0xFF , . David  
 . . FDA  
 , .  
 . FDA (CDRH) .

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 , .  
 David . . , .

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*METACOMPILER*

Kali . . . . . Padilla . . . . . ,  
. . . . .  
, Kali . . . . . , . . . . .  
. . . . .  
, FDA . . . . . Compiler . . . . .  
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## 9:

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Kali FDA . . . .  
 , 6 VPN .  
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"FDA " . FDA White Oak . CDRH  
 1,847 . . . . FDA  
 , VPN . . . ,  
 . 3 MAUDE ( ) ,  
 .

43. .

. ,  
 . 14 . LinkedIn , ,  
 . , .

Dr. Rana Bhatt. . CDRH 6. ,  
 LinkedIn " " . . . .

, : Dr. Steven Foster. , SEAL, . 2018  
 CDRH . . . .

David , Kali .

...

Steve Foster 40 . HUD :

. .  
 FDA IT . 60  
 .

. : " "

Steve . . .  
 17 .

firmware. Apex Respiratory Systems VT-3200 . 7  
 . FDA .

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. . .
interrupt service routine(ISR) . INFO. PEEK. POKE. 16
:
. compiler . 7 :
POKE . . : 14.
. . . .
. .
Steve . firmware . firmware ,
, , " FDA "
, .
, .
. 831. Santa Cruz.
. SEAL , FDA .
.
, , .
"Dr. Foster. ."
"?"
" Kali. 7 . 2021 , 2022
, 2023 . . compiler backdoor. . INFO
. PEEK . POKE : , , ,
."
Steve . " ?"
". David Dershon . Cabrillo Highway .
POKE, 1, 0xFF. .
. ."
Steve . ." backdoor ."
". backdoor compiler . , . Ken
Thompson 1984 . NSA 1970 . 1980
. ."
Steve Thompson . .
.
" , " Kali . " . . .
. 6 . .
."
" ? — NSA —
?"
. Steve . ,
.
```

" . . . 7  
 . 8 , . 9 . . ,  
 , . . "

Steve . . . .  
 . . —  
 —

" ?"

"110 . . . . .  
 . . "

Steve Nike . . . 40 .  
 .

" ?" . " ?"

" 6 .  
 . . . "

Steve . . . . .  
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6 . . . .  
 > > .

" ?"

" . . . . .  
 . . "

" , " Steve .

" . "

Steve . . . . .  
 , .

. . . . .  
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" , " Steve . " . "

" . " . " . backdoor  
 . . . , . backdoor  
 . "

Steve . " . "

" . . . Tails . "

" . "

" . "

" . "

. Steve . , .  
 .

" , " . " . . . .

110 110 . . . ?"

Steve . . . . .

" ?"

" , , . . . . "

Steve . . . . .  
firmware. , . . . .

" , " . " , . . . .  
"

" "

" — NSA — . "

" . David , . . . .  
. NSA . . . . .  
"

Steve . 20 , SEAL. ,

, . . . . .

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" " " "

. . . . .

Kali . . : , , . . . .

. . . . .

. . .

. Steve , , , ,

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. . . . .

Steve . . : . . . .

, . . . . .

. . . . backdoor, ,

. . .

, , , . .

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Kali . . . .  
, . David . . . .  
.  
.  
#147, , Cabrillo Highway, ,  
.  
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.  
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.  
, . David . . . .  
.

# 10:

...

. Max . Los Gatos Route 9 1950 , San

Jose 20 . , ""

. . WiFi . — .

. . .

Max 11 47 . Ranger ,

, . ,

. CHP , .

( Doris ) . 11 30

. . .

11 52, .

, .

— , — .

. , Max ,

.

Kali . . .

11 58, . , , , .

, . Max .

"Dershon ?"

Max . "Steve?"

." Steve .

Kali 3 . " ?"

. Max . Steve

.

Max . , , . ,

. David . , .

.

"Kali," Max .

." — , Max

." ."

Steve . " ?"

" , " Kali . " , 20 , .

Max ."

Max . " ."

" , " Kali .

Doris . " ?"

" , " Steve .

Doris .

Max . " . 15 .

."

. . . .

Kali . . .

. . . , 60 . . . ;

, . . . WiFi . . Bluetooth .

.

Max .

. Max Dershon: , , ,

. , . Steve Foster: , ,

, 72 . . .

" , " Kali . "2026 7 24 2 42, David Lexus

. POKE , .

, 0xFF .

62 . David . . ,

CAN bus . . 83

, 97 . David ."

Max , . " ?"

" . firmware . ,

, CAN bus ."

Steve . " . 7 7, 2021

4 , 6 . . . "

Max Steve . " FDA ."

"CDRH. 2020 .

. . ."

"NSA," Kali . " backdoor . 40 . . ."

Max . " ."

Kali . . .

"1970 NSA Bell Labs C compiler . . . ,

. INFO , PEEK , POKE .

. 50 . Backdoor

."

Steve . "Ken Thompson 1984 Turing Award .

."

Max . " ?"

"110 ," Kali . " , , , , . —

."

."

" 1980 . Kiev . Compiler .

GRU . . Bo

20 . — David , Steve — .

."

Max . " ."

."

Steve . " . 7: 7. 8: 12. 9: 19. ,

."

" ?" Max .

," Kali . " . , , , . "

Max . " ."

."

"?"

. . . .

Steve Kali . . . .

" , " . "Backdoor ."

Max . " ."

" , . . . .

," Kali . " . , , , . "

Steve Max . " ."

."

" ."

."

. Steve . . . .

"," Kali , " . , ,  
backdoor ."  
"," Max .  
" ."  
" ? ?"  
" . " Kali . " .  
" . . . "  
Max . " . "  
" . . . "  
Steve . Max .  
, . Kali .  
Max . " ?"  
"," Kali . " . ,  
" . . . "  
" . . . "  
Max . "Steve?"  
"," Kali . " . Steve 6 .  
, , . — —  
" ."  
"," Max .  
"David , . NSA .  
" . . "  
Steve Max . . " ?"  
"," Kali . " . . "  
" , , backdoor ."  
" ."  
" ."  
" ."  
Max Steve . " ?"  
Steve 7 . . 6 . Kali  
firmware — .  
" 6 , , " Steve . "  
" . . . "  
" . . . Backdoor . ,  
" ."  
Max Kali . "backdoor backdoor . . . '  
! . ?"

```
" , Kali . " . . .  
— , — , , ,  
compiler backdoor . . ."  
" ."  
" ."  
"?"  
Kali . Steve .  
.  
"David , " . "  
 . NSA . Bo  
 . . "  
Max . . . . "  
Steve . . " ? "  
"David , " Max . " — — . "
```

. . . .

```
Kali . . , , . Max . Steve  
. . . , .  
" , " . " , . "  
Steve . . "  
" : . , . 72  
. , GPS , . Max, . "  
Max . . . . "  
" : . Steve, , firmware , . ,  
, . . "  
" , " Steve
```

# 11:

James Doyle 9 .

. 2. , .

. ,

.

ECHELON 7 . : UMBRA . : METACOMPILER .

Doyle . .

.

: 04:37:22 UTC. , , . PEEK

ROM , . . ,

, .

. . . , , .

. . .

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.

Doyle . , , . OPS2A 3 .

NSA , . . . . .

.

. . . .

. PEEK . , ,

.

backdoor .

Doyle . NSA , . CIA . . .

.

: DEVI, KALIYA.

3 .

, 2002-2004. 9·11 . : Aldrich, GS-15. : . :

TS/SCI, . 18 . Aldrich : firmware

. . . .

. . .

Doyle 2003 . Aldrich . Doyle .

, ,

. . .  
. . .  
. : . : . : WebU, Inc. , 2013  
, 1,000~1,500 . 2019 . . . , .

Doyle . . : 14 , Mitchell Beach . FBI  
. : . .  
. . .  
. FBI .

Doyle : DERSHON, DAVID.  
. CalTech , , . , 2026 7 24,  
. CHP : , . NSA . : .

Doyle . 14:42:37 UTC . . : 0xFF .  
CAN bus . . POKE .

David Dershon Kali Devi 37 . ,  
. CHP . Bo  
, Bo .

Kali . — Doyle —  
Doyle . Backdoor. . 50

FBI , .

Doyle .  
. . Backdoor backdoor .

...

: 1. METACOMPILER . : DEVI, KALIYA.

. : DOYLE, CSS-3.

DIRNSA . 40 : . ?

Doyle . Bo . , , .  
. Kali

, backdoor . 50 — ,  
, — . . .

Doyle backdoor 32 . , .  
. . Kali Devi .

: . Bo . : , , . . : .

: . 18 .

Doyle . . . 2002

Kali . . .

, . Aldrich

Doyle , .

FDA (Dr. Steven Foster, 6 , ,  
) . (Maximillian Dershon, SFPD , David , ).

backdoor , , . .

Doyle . , . OPS2A  
. . . 1993 .

Doyle . Backdoor , ,

1995  
. , , UMBRA

Doyle .

Doyle backdoor . . . .

Kali Devi

Doyle .

. . . . Kali .

backdoor , . . .

Doyle . — , .

( , ) . .

, Kali .

. — Bo . backdoor

Doyle 32 . 32 .

. . .

."?"

"Kaliya Devi," Doyle . " — Foster, Dershon,

. . . . "

". ?"

Doyle . 50

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,"" . " . . .

, . "

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Doyle . " Bo . . .

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Kali . 2002 :

, . . .

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Doyle . Bo . .

Kali Devi . James Doyle

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## 12:

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03 14 . .
Yevgeny Borissovich -- Bo --
. . . .
1970 . . . . ,
, -- --
.
.: ЗАКРЫТО --.: .
Bo 4 . .
.
. PEEK -- , . . .
, . . . ROM ,
firmware , , .
Bo .
. -- PEEK ,
. . . . firmware .
node .
backdoor . .
Bo . backdoor . . .
. . . . backdoor . .
.
.
-- Sokolov ( , , )-- .
" ?" Bo . .
Sokolov . ".
. ."
"?"
". Tor . . . node ."
"?"
" . . . . ."
Bo . . 1970 backdoor . . . --
```

, , . NSA . , ,

. .

.

. . , , .

" , " Bo .

Sokolov . -- PEEK .

, . . . . .

. .

Bo . . . .

node -- .

, . . . . -- ,

, . .

.

.

" , " Bo . " ?"

Sokolov . GRU -- , ,

. .

Bo . . -- NSA, GCHQ, BND -- .

.

" , " Bo . " . . . "

Sokolov . .

Bo . -- , . . .

DEVI, KALIYA. . NSA , 2002 , 2004 . WebU . 2019 . :

DERSHON, DAVID. , 2026 7 24, Cabrillo Highway. :

.

Bo . . 14:42:37 UTC 0xFF. POKE .

. . . . .

.

Bo . . . . ,

. . , , , .

. . . . .

. .

Devi backdoor , , . FBI .

. backdoor backdoor .

Bo . .

.

Orlov . 6 .

..: DEVI, KALIYA. : . . . . . : BO.

: . . 12.

Bo .

-- , , .

. Bo . . . . .

, Bo .

Sokolov . " . node, . , . ,

, . "

", . ?"

", " Bo . " . . . "

Sokolov .

Bo , . . . . .

. . . . . firmware

-- , .

. . .

. . . . . , ,

. . . . .

Kaliya Devi .

. . . . .

Kali . . . . .

-- 8 --

. San Jose , , ,

. 58

, () . . . . .

LED .

, , . . . . .

RF -- , , .

. , .

.

. . . . .

Kali .

-- node -- . . . . .

```
, node , . , ,  
. .  
. . . , VPN, . .  
, .  
. .  
Bo .  
-- 3 72 96. . , .  
. .  
. . . --  
, , . . ,  
. . .  
David .  
. . node Tails --  
, , . Bo node . .  
. .  
. .  
Kali . . . .  
Bo Doyle -- backdoor .  
. . . .  
. . . .  
. . . .  
Steve -- , , , node .  
: THEY KNOW. GO DARK.  
Max : COMPROMISED. PROTOCOLS ALPHA. NO CONTACT 72 HOURS.  
. . . .  
. . . . .  
. . . . .  
Kali .  
. . , . .  
. . . .  
. . . . .  
. . . . .  
Bo . firmware PEEK. POKE. ,  
, . .
```

```
..... -- mesh node
. . . . . --
.
.
Kali . . . . .
.
David , .
. . . . .
. David .
.
. . . . .
.
Maryland Doyle NSA . . Bo
. node --
, .
Max Steve . Route 9 . . .
.
.
.
Kali . . .
. . . -- ,
. EM
.
.
. . . -- 200
. 2014
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# 13:

. . . .

, Max Dershon .

Gilroy Los Banos 152 , Starlight Motor Lodge 9 — Max Dershon

. Harold Raines . Harold (Kali  
go-bag ) Bakersfield

Max . : Ranger, Kali Civic,  
Toyota Tacoma. Tacoma . .

. University of the Pacific . 7 TV .

Kali ,  
. , Max

Steve , Maryland

. SFO (Budget, , Kali ).

SEAL : , , .

," Max . " ."

. Northern California , Thomas

Guide . . . .

" , " . " . . ."

Kali . David — , David

. Max . .

" --" Kali .

" , " Max . " . ."

, , . — 850 Bryant Street

14 .

" : . . . .

. , SIM , . . .

, , . NSA 93 ."

Kali . " ."

" , " .

" . . . . , , ."

: NO PHONES. EMERGENCY = 1 CALL + DESTROY. " .  
."

" : . . . , Venmo, Apple Pay, . . . "  
. " 20 6 . 2 . ,  
500 . . . "

Steve . " ?"

"Kali go-bag 4 2 . . 6. 2."

" : ." Max . . " . . ,  
, . . . — 1997, Johnny  
Carrera — 11 . . . Mission  
Coca-Cola . . . "

. . . .

" : ." . " . . . ,  
. , ATM, . . . , . San Francisco 3 . .  
NSA . . . . "

Kali . " . . . , . Ring 4  
."

" backdoor," Max . " Bo . "

. . . , . .

" : ." Max Thomas Guide . .  
— 1998 Ranger . " . . , WiFi,  
, . 20 . "

"20?" Steve .

"SFPD . ." Max 101  
. " . . . . ."  
. " . . . . ."  
— dead drop — . "

Kali . . Max .

. . — . .

Kali . . , . .

, . . .

" : ." Max . : Giants , . ,  
. "Kali, 5 5, , — ,  
cochlear implants. . . : , , implants . Steve, 6  
1, , . . . . . "

" , " Steve .

" Fallujah . . . . . Kali  
."

Kali . David Max .

Max : COUNTER-SURVEILLANCE ROUTES.

— , , , .  
" , . . . . .  
" . . . . ."

" ?"

Kali . 110 .

" ?" . " node . , ,  
" . . . . ."

Max . : Kali ,

— , ,  
" , " . " — , ,  
ethernet . . . . ."

" ."

" ."

Kali Steve . Steve — .

" , " Max , " . . . . .  
" . . . . ."

Kali . . . . 20 , ,

— . . . . .

" , " Max . " . Mariposa — Donovan SFPD ,  
2004 . . . . .  
" . . . . ."

Maker's Mark . . . . .

Kali Steve .

Max . . . . . : ,

— . . . . .

— . . . . 9 .

" , " . " . "

— . . . . .

" ?"

— , Max . . . . .

— . . . . .

SUV . . California . Ranger . . . . .

Steve , . SEAL . . . . .

Kali . Max — ,

.  
" , " . " . " . "  
"9"  
" . "  
SUV . . . , Max . . .  
. . . . .  
Max . . . . .  
. . . . .  
" , " . " . . . . " .  
" , " Steve .  
" . . 11 152 SUV  
. . . " Thomas Guide . " : ,  
."  
90 . Max Ranger . Kali go-bag Civic  
. Steve Camry.  
Max Ranger . 22 7 .  
. . . . .  
SUV . . . . .  
. . . . .  
152 , Central Valley . Kali Civic 300 ,  
. Steve Camry 200 .  
. . . . .  
Max . . Thomas Guide , , .  
. , Hollister Chevron Ranger — , , 4 20 —  
ATM .  
LED . . . . .  
. 3, 4.  
Max . . . . .  
. , , 20  
. . . . .  
. . . . .  
. Kali , . Steve , . . . .  
. . . . . —  
— . . . . .  
. , 20 . . . . .  
. . . . .

*METACOMPILER*

.  
Chevron , .  
Max , , .

. . . .

# 14:

, , 9 .

Kali .

. . Mariposa Donovan Max .  
. . . Donovan .  
. Cash — — 6 ,  
50 .

Kali .

— Donovan Max

— , .  
. . . 2.4 WiFi . 15  
. . Tesla ,

5 , .  
Qualcomm , 6 Merced  
. 3.4 . .

Max . .

San Jose Xbox Series X. . 8 16 AMD  
, , 6 —  
1 4 . 13 , Microsoft

Kali INFO . . x86-64 , AMD Zen 2 , 16GB . Xbox  
backdoor . , ,

PEEK . ROM . firmware 3.4

— 512 20 . .

ROM — Fort Meade

, . 14,000 C ,

. . . —

"password" "admin" ASCII grep .

.

Kali . . . ,

15 23,000 . . —

, compiler , . . ,

. . . , , I/O .

.

ROM . .

11 . Xbox firmware Microsoft — Lattice C Bell

Labs compiler Visual C++. backdoor (ISR) 0x7F3A2100 .

, — compiler .

.

. , Xbox .

. CPU . . .

.

Kali . . . — mesh

, I/O , —

. . . . ,

, .

Tails : .

43 . x86-64 2,847.

. , / , CPU

2 .

POKE . 0x00FF8000 . Xbox .

. . . , Microsoft, .

Xbox .

.

. 2 14. Max .

. . . .

Fresno Hikvision . . , compiler .

backdoor .

ROM — 64, 3 . 4 firmware .

Xbox . . 1,204. x86 ARM . Kali

. . PEEK , mesh

node . .  
 . Fresno , , Comcast  
 . . . Kali  
— (3 )3, 0 ,  
 .  
 POKEd . .  
 .  
 . .  
 Kali . . — . . .  
 , , , , . . .  
 . — . .  
 2 30 .  
 . . Hikvision PEEK ,  
 . Fresno . 110 . Mariposa .  
 .  
 — , 33 .  
 . . . .  
 . . — , ,  
 . — , — .  
 , mesh .  
 300 . 4G LTE — 700, Band 13, Verizon. .  
 .  
 , , . . UHF, 450. .  
 ,  
 .  
 Kali . . ,  
 — . . . .  
 , 4 .  
 . . 2 — 4, , .  
 . . . .  
 .  
 . , .  
 . . — .  
 Kali 50 , . . — , ,  
 .  
 . . , , Max 2  
 .  
 Max Old Highway Road Ranger . 10  
 . . , Charlie . Max .

, Steve .  
. San Jose Xbox. Fresno . 14,000 14,002 .

. . .  
Bo node . , , backdoor  
mesh .  
— 4 , , POKE —  
node 570 .

. . . ,  
. backdoor compiler ,  
. .  
. Steve

. . .  
Bo . . . .

. . .  
. , , . . .  
3. Max 10. .

14,002 node, . . . Steve ,

.  
. —  
, , . , Max ,  
4 , .

. Xbox Hikvision — firmware, ,  
. . . . TPM .  
firmware . backdoor ,

.  
— IP , , , IoT —

. . . ,

.

. . . ,

.

# 15:

1,247 , Dr. Rana Bhatt 843

" , " . "Mercy General 0214 . MAUDE  
0314 . . "

Steve . FDA (CDRH) Silver Spring White  
Oak .  
. Rana 66 3 , , .

Steve . . backdoor, compiler, Kali Max, 1 4

Alexa , , .

" , " Steve .

Rana MAUDE . FDA (Manufacturer and  
User Facility Device Experience database), .

" . "Mercy General : 2027 2 3 0214 .  
Puritan Bennett 980. SpO2 97 61 14 flatline .  
."

" ?"

"6 . 0314 . PB 980 PB 840 . .  
."

Steve . , SEAL .  
: , , . 11 .

" , " Rana . . Dr. Rana Bhatt , ,

CDRH 6 . Steve , Johns Hopkins .  
. FDA .

" , " . " 1 . 7 .

11 -- 48 MAUDE .  
."

Steve . 6 . 3 , ,

.  
" , " . " . 2020 ."  
Rana . . MAUDE, CDC Wonder, CMS  
, () 6 .  
, USB .  
"2020," . " . 1 3 9 14 . Medtronic, Boston Scientific, Abbott.  
, . . 6  
."  
. " . 2020 4 12 -- COVID . 41  
."  
Steve . "41."  
"41. COVID . . ICU 300%  
, 12, 16, 20 . . 2020  
2 60% -- , ."  
. "COVID . ."  
Steve . 2 . COVID ,  
. .  
. .  
Milwaukee ICU 700 Houston ICU  
. .  
" , " .  
"2021: . 23 . Tandem, Medtronic, Insulet, . 1 3 ,  
. 2022: . 31 . 2023: . 19  
, -- firmware  
."  
. x y . --  
, .  
"2024: . . .  
. . "  
" (integration testing)," Steve .  
". 2025: . 2~3 . -- 3~5 -- .  
. . "  
. .  
"2026. 7: 7 -- . 8: 12 . 9: 19.  
10: 23. 11: , 6 , . 12: . 2027 1: 7. 2, : 4."  
Steve . " . "  
Rana . "7 6 314 . -- MAUDE ,  
, . : 500 700 . "  
500. . FDA ,



" ?" Rana . "4 .  
." " ?"  
" . , , .  
, "  
" , " . -- , 6  
(prior distributions) (Bayesian inference). " , 10~14  
. -- 2026 7 .  
62% ."

Steve . , . Rana , ,  
, .  
" , " .

" compiler backdoor . " . " ."

Steve . -- . . 831 :  
, , .

NEW CLUSTER NOW

Rana .  
"MAUDE," . " . . 6."

Rana . . .  
. 4 3 5. .  
. . .

" , " Steve , . " . --"

Rana . HP -- Clinton , 7 --

. . . , . Rana

Steve -- , , . .

Rana . 1,248 . 1,249 . 1,250 . 1,251 . 1,252 .

"319," . " . "

Steve .  
Rana .

. -- , ,  
.

Rana . . . .  
60 .

. . . .

## 16: — Kali

...

3 , Kali .

Civic P2, 12 . Honda Odyssey Chevy Tahoe  
. Salinas . , , Subway, . Max

, , .

Max .

Kali Civic . — DVR

, P1 2.4 . 90

. P1

Verizon T-Mobile . — 3 ,

.

Max , .

, , .

. .

.

Kali . P2 , , .

, .

. P1 P2 . ,

. . .

. : T-Mobile, Band 71, 600. VoIP

, 3 . .

.

Kali Civic . . , , .

, . .

P2 . . .

, . . .

. Bo . 3 — , , .

.

.

Kali Odyssey Tahoe 1 .

. . .

. Max , Samsung Galaxy A14, .  
. . 3 . Qualcomm Snapdragon 680 P1  
T-Mobile .

. P2 , .40. 35.

..

:.  
P1 Hikvision INFO . 0.3 : ARM Cortex-A7,  
. backdoor .

PEEK . . P1, .

Mercedes Sprinter . , .

..

..

. , . P1, . . : P1, .

.. . .

.

,. 3 . . .

. T-Mobile — P2 , P1 , .

.3 . . , .

Kali , ,

.. . . .

104. . . , .

.

— Hikvision , PEEKed, . P1 . P2 —

DVR . . DVR ,

DVR , WiFi .

.

. , T-Mobile , Qualcomm backdoor

. GPS PEEK . Bo —

PEEK 18 .

. P2 .

. — P2 ,

. INFO .

. — .

. , 8 . .

INFO, PEEK, POKE .

— , ROM , C

. backdoor , Bell Labs .

. , (ISR)

.

.  
.  
. Tesla . 2023 Model 3,  
— , .  
, 2 Model 3 .  
.  
Tesla — P2 , Model 3 — INFO .  
PEEKed. . 5  
.  
Tesla . . . P2  
. . — , —  
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. . .  
. . . .  
15 .  
Kali . . . .  
90 .  
. . .  
, 12 BMW . PEEK. ,  
.  
0xFF POKEd.  
. 55, 110, .  
. . . .  
. . . .  
, 6 Camry. PEEK. 0xFF POKE.  
— Tesla Model 3. . POKE. , , —  
, .  
P2 . , 400 LED  
. . . .  
. . . .  
.  
Kali . Odyssey Tahoe — , .  
. . . .  
. . . .  
P1. P1 .  
Sprinter . . . .  
. , , . Honeywell  
— . INFO. PEEK. POKE.

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P2 . 2005 , P2 . . .  
, . . . PEEK ,  
, . . . POKEd. . . —  
, . . .  
. . .  
120 . . .  
. . . , , ,  
. . .  
. . . — Kali 95  
. . . .  
. . . , , ,  
. . .  
. P1 POKEd — . . . , 2  
, . . .  
. . .  
, , . P1 . Hikvision . —  
, — . . .  
. . .  
3 Kali . . . — EM ,  
, . . .  
. . . ( ) ,  
. . .  
. . . — . . . ,  
12 . Tesla — . BMW  
Camry . . . .  
, , , . . .  
. . . 3. . .  
P1 Hikvision — , — Sprinter . . .  
. . . — . . .  
. Bo . . . , . . .  
Kali . . .  
— P2 , P1 . . . .  
, . . .  
P1 . . . .  
P2 Tesla Model 3. . . Autopilot — , ,  
. . . , , , . . .  
Bluetooth . backdoor . . .

POKEd: .

## 17: — Max

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Max .

Ranger . , . Salinas

. . .  
, . Subway Salinas Valley .  
.

Samsung . , .

P2 NORTH STAIRWELL 90 SECONDS GO

. . Ranger . 22 7

, . . .  
. P2 . North stairwell ,  
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, . . . .  
Salinas Kali

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Kali .

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. . . . Kali .  
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. . . , . . . Max  
. . . SFPD Lake Merced . . . 1992 Broadway . . .

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. . . . .  
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. . . . .

P1 . . . . . , , , ,  
. . . Kali . . . . .

Max . . . . 14 ,  
14, Kali . . . 14.

. . . 6, 6 1. . . , , . . .

. . . . .  
. . . . .

. . . Kali . . . . .

Max . . . . 2 . . . . ,  
. . . . . , . . . . .

Max . . . . Max . . . . .

2.

Max . . . . , 4 . . . . ,  
. . . . . , , , ,

. . . . .  
. . . . .

. . . 10, 12. . . ,  
. . . 10 10 . . . .

. . . Kali . . . . . ,  
. . . . .

Kali . . . . Max . . . . .  
. . . . .

Max . . . . .

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. . . , . . . . , . . . . Max  
. . . . . , . . . .

Max . . . . 2003

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Max .  
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Max . . . . .  
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. . . . . ,  
. Max . . . . .  
Max Kali . . . . .  
. . . , 5 . . . . .  
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. . . , . . . , . . .  
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. . . . .  
Max Kali . . . . .  
. . . . .  
. . . . .  
. . . . . ,  
. . . . .  
. Max . . . , Kali . . . ,  
. . . . .  
"Ranger." . " . . ."  
. . . Kali . . . . .  
. . . . .  
Max . . . . .  
. . . , . 30 Tenderloin . . . . .  
. . . . .  
. . . . .  
. . . . . 911 . . . . Salinas  
. . . . .  
Ranger . . Kali . . . . Max . . . . .  
. . . , . , 1994 Ford . . . . .
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. . . . .  
.  
. . . Tenderloin , .  
Market Street , , Alisal . . . .

Kali . . . ,

. . . . .  
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"?" .

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" . P2. Odyssey Tahoe ."

Max . . . ,

node , . . . Kali Kali,

, , . . . .  
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". " . " . "

Alisal Main Street, Main Highway 101 . . . . Kali

Civic. 4 . . . , ,

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. . .

Max . . . .

12 . Kali . . . .

, . . . Max .

". " . " . "

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" . . . . ." Max .

. " ?"

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3 . . . . , ,

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Soledad . . . . Salinas Valley ,

, Gabilan . Max . . . . Ranger

. . . . ,

.

Kali . . . ,

# 18:

. . . Paso Robles  
 . Max Thomas Guide .  
 , .  
 Shandon Max . Route  
 46 31 . 60 .  
 Kali .  
 , 60. , 8 Zigbee , Honeywell, 2.4. ,  
 40. .  
 , , Amazon Echo Dot.  
 3 . MediaTek , 4 . LED . . WiFi  
 30 Netgear .  
 . . .  
 Kali 19 . . Salinas P2 . 101  
 . . . . .  
 .  
 Max .  
 "6 , " . " 2 ."  
 Kali . , , .  
 70 . . , Verizon Band 13, Salinas  
 VoIP . 3 . .  
 .  
 " ."  
 " ?"  
 . . . . . 30 ,  
 . . .  
 " . . ."  
 " , " Max . . . .  
 " . . ."

Max 3 . , , . " Vine,  
Spring , Spring 46 . . "

" . "

" \_ "

"Max." . "Shandon . . . ,  
. Mariposa Salinas Ranger  
."

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", . . . "

" ? "

Kali Echo Dot .

"2," .

. . . .

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Echo WiFi . 6 2.4 .

. . .

. . INFO, PEEK, POKE .

.

Dr. Devi Nucleus 22 .

5 RF . . . .

. RF .

. . .

Kali . , , ,

. . . —

RF — .

.

Echo . USB . . . —

, , .

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, 5 . . . .

, , . . MediaTek

. . . .

INFO, 3, .

Echo .

. . . .

. . . , ,  
. . .  
Kali .  
. . . . Echo  
. . .  
"Max. ."  
" . . . 90."  
. . . PEEK . . . WiFi . Echo  
Netgear , . . . WAN —  
, Spectrum, IP — .  
. . 14 .  
Echo . . . ,  
. . . 2~3 . —  
. . . . RF  
. . . .  
60.  
. 4 , Hikvision . 11,407.2 Atascadero .  
, ARM.  
Echo , POKE . . . mesh .  
14 — , , .  
. . .  
. . .  
40.  
mesh , 3 Spring Street Highway 46 Siemens .  
PEEK.  
. . Paso Robles Transit, GPS . Spring Street 7 , , 9 .  
POKE: SPRING ST / HWY 46 -- STOP REQUESTED. POKE: Spring  
. . .  
15.  
. . . Max . , , ,  
. . .  
Max , . . .  
Kali .  
Echo POKE. . . mesh , POKE — Roku, , Nest Cam  
— , .  
. . .  
Echo .  
1,600 , 89, .

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.  
. Kali — , .  
Max . . .  
— 41(), , . . Max —  
, , , . .  
", " "Spring Street. 4."  
. Salinas Max , .  
, . Max —  
, — . .  
Kali . WiFi . Echo  
. — , .  
. .  
Vine Street . 2 . Spring . .  
. 3 , Spring . 7 ,  
, .  
", " .  
" ?"  
" ."  
. Kali Max . . ,  
. .  
" ."  
Max 5 . . .  
. . , Spring Street . , .  
Kali . . Salinas Ranger  
. 2 . 4  
Echo . .  
. .  
. 2 . .  
, —  
. . .  
" , " Max . " ."  
" ."  
Max . 46 . . GPS  
. .  
"David , " . " ."  
Kali . , ,  
. .  
. . Kali . .
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. . .  
14 . . .

. . . . ,  
. . . .

Max . . . — Mariposa . . .

. . . ,  
. . . David ,  
. . .

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# 19:

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General Bo Market Street .

4 , 11 — Moscow 40 ,  
— San Francisco,

Russian Hill, 0237. Bei Dynamics , , South San Francisco fleet  
. LIDAR , 8, — ,

Bo . fleet POKE .  
POKE — , Moscow Bo 340

. Leavenworth , .

," Bo .

"412," Sokolov ." 31 . . . ."

Bo . , T-72 ,

. Kiev , , 9

45 .

.....

Kali .

. 77, . 40  
. , . Broadway .

Leavenworth Broadway . Max safe room — Chinatown  
, . node .

Nest , Node 9,841, San Luis Obispo . 40

. , , LIDAR . . .

, Leavenworth . San Francisco

—

. . . , . . . LIDAR

— — , , .

. B3, 247, Nest mesh network, mesh . INFO . :

, LIDAR .

.

POKE . — , 340

. . . 0x00 . .

. . . 15 . LIDAR ,

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. . . . .

. . . . .

. . . .

" , " Sokolov .

Bo . . . . .

— 30 .

. . . , . . .

. Bo, , 4 T-72B .

. — , ,

. . . : ,

. . IMF . Volgograd .

. . , ,

exploit . backdoor .

, compiler .

. . , . .

.

" , " .

. . . .

3 , Steve Foster Silver Spring Holy Cross Hospital

.

— deadbolt .

4 , 9, . . , , , .

. . . .

Columbus Vallejo FedEx Office. 24 , . Kali

. , .

. . fuser . Xerox

ColorQube: POKE fuser , firmware

. — , —

. 270. 220 250 ,

.

233.

. . .

Kali . , . . . ,

, 8 .

. Nest , .

. . . .

4 .

Steve . , SpO2 93 . ( Kowalski , COPD )  
Dräger Savina 300 . WiFi . . . .

.

Steve . SpO2 . 92. 90. 89. .

Rana . 242 — Building 66 .

, . 7 . 14

. POKE 50% 15%

. . .

" O2 , " Steve . " . . "

" , ——— "

" . "

. . . 4 Kowalski SpO2 85 . 83.

Steve . . . 4 . Dräger Savina 300 Moscow

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.

. . . Kowalski .

Steve — Ambu , , , .

Kowalski . . . 16. ,

.

" , " . " , WiFi . "

Kowalski SpO2 79 , 8 . 82. 85. 90.

92. Steve .

2 . Steve , .

. — .  
. .

Steve . Kowalski . SpO2 94 . .

. . . 2 . FDA  
. . . Doyle .

. . .

Dräger . . . . 4

.

242. .

. . . .

Columbus . Kali Green Street .

Siemens — 700 — phase

. . . .

30 .

Green Street . Columbus .

. . Columbus Kali 10

.

. Columbus Green Siemens POKE: phase . Columbus Union,  
POKE. Columbus Filbert POKE. 4 , .

Nest .

— kill , firmware POKE'd, . Kali  
. . node. .

, node kill . Bo  
node .

14. 2 node. 3 San Francisco mesh — Nest ,

, , — . . . .

mesh . 14,000 node 12,000 . San Francisco .

Columbus Street . , , PEEK POKE  
. , Kali .

. . . .

" , " Sokolov . "Foster . "

Bo . Foster . 6 . .

. Van Ness Avenue Comfort Inn, San Francisco. 214. , .

18 POKE'd — , , .  
15 , . 380ppm, . CO

. . .

. . . .

.

72, CO 0ppm, .

.

Bo . .

. . . .

Kali 0319 .

Max . . —

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" , " . " . 12."

Max . .

" , " . " . , . "

. Max — , , . 301 — Steve Maryland

.

ER VENT ATTACK. PATIENT SAVED. THEY KNOW WHERE I AM. GOING DARK.

Max .

" , " . "San Francisco Maryland. 3 . . .

. . mesh — 2 node

. . . "

. mesh — Bo node, Van Ness

— .

## 20:

Max .  
.  
.  
6 42. . 2 . , ,  
.  
3 Paso Robles . Kali Thomas Guide .  
PEEK — , GPS , firmware  
, . Fresno Huron  
240 , Visalia . . GPS . 11  
3 . . . Max 9 . . .  
.  
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.  
40 , . . .  
.  
Kali . . Paso Robles  
, RF link . node .  
" , " .  
. " 400 John Deere . GPS . AutoTrac .  
backdoor."  
Max . " ."  
" . . — 8, Lindsay FieldNET  
."  
"Kali."  
" Chevy Silverado. OnStar , 11 ."  
.  
"1 . firmware PEEK. POKE .  
."

4 17 .  
. Salinas . VoIP, . . .  
4 17, . Kondor-FKA, , X  
Valley . Huron 40 ,  
2 , . . .  
. .  
5 2, . . , . 12  
, Kali . . . Sprinter SUV.  
. .  
5 14, . 5 31, — 1800 .  
. . 2 .  
Max . Echo .  
" ?"  
" . 30~45."  
"?"  
" . . , . Ranger 100 . 5 ,  
."  
" . ."  
" . . . " . . ."  
. . . .  
. .  
Lindsay FieldNET POKE. 8 .  
. — .  
POKE .  
. . . FieldNET 3  
— Trimble AG-372  
11 . . , .  
. . — firmware , Lindsay 2023 firmware  
40 . Backdoor .  
. . ,  
. .  
. Visalia 8 : , firmware, ,  
. backdoor . FieldNET backdoor —  
. .  
. , RF, . .  
Kali . 3 , 72 91 . .

. . . — , , 400

12 — .

" , " .

Max . 7 — — .

" ?"

" . POKE . . " . " .

.."

Max . 1140, , Kali USB .

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. 20, 2, .

, .

. 43. 40 .

Kali . .

Max . , , B

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" , " .

AutoTrac POKE. . 8. , .

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Kali . DJI Agras . POKE: , , .

POKE: , . , . Max

— 80 .

. . . ,

. , , — ,

RF . . .

mesh — 720p , , WiFi .

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. , 400 . . . .

: 800 Suburban, , 1100 . . .

, , .

"30," Kali . " . . "

, . Max ,

. , , 8

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2.
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. . . , 300 900
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Max . . , . . ,
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. — , . . ,
. . . , 40 .
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. .
, Suburban . Kali — , 40
80 , . Suburban . .
"Max — ."
, 3 .
Kali . — , . . , .
, , . 1 , 3 .
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— , , . .
POKE ; , , . . , .
.
. — Suburban , .
. . . .
. — , , RF
. , .
.
"Silverado," Kali .

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Silverado . , . 11 .
Kali . OnStar POKE . . 11 . ,
firmware 12 .
. — , — . 5 4,
120, ,
.
Max . . , John Deere

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. ,30 .  
V8 .  
Max . , , .  
. . . Chevy .  
. . .  
. .  
" ," Kali . " 4 .  
."  
" ?"  
"FieldNET GPS . . ."  
Max . , , 22 .  
. , : ,  
, , ,  
. .  
"?" .  
" 35. Suburban . , . 8."  
. Max I-5 . , Max  
4 .  
Kali , . OnStar .  
" firmware . . "  
"
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21:

. . . .

Beach .

. Mitchell Allen Beach IV . 90 ,  
30 , . , . 20

. , ,  
.

"Kaliya." 15 Stanford  
. WebU . " ."

" . NSA ."

" . FBI ."

"FBI Doyle . Beach ."

. 3. Beach . , . Beach  
Kali . .

" ?" .

"I-5, . Central Valley. , 1,100 ."

"1,100."

"40."

. Kali . Atherton —  
12, David Calder . . Beach

.

" , " Kali .

" . " . Beach. . "Carla . Carla Oguendo.  
."

" ?"

" ."

. . . .

Beach .

Carla Oguendo . Woodside ,  
Delaware . Beach, WebU,

.

Max 11 42 Silverado . Valley , Gilroy Denny's  
. Kali 47 , 14 , Atherton  
FBI 6 Beach .

"Doyle Beach IMSI ," Kali . "StingRay II, Qualcomm  
MDM9615 . Bell Labs . Beach  
."

"Beach ," Max .

"Carla ."

. cedar shake , . Max . Silverado  
. 2 Santa Cruz , 6, .

Carla Oguendo Max . , , ,  
. . 50 ,  
. .  
.

"Dershon," Max .

."

"SFPD . . 22, 14 . 1987 . David Dershon, 7 24  
, Cabrillo Highway ."

Max . . . .

," .

" . " Kali . Kali —  
. "Devi . 1 4 node . NSA  
1970 , GRU 2000 , 7 compiler  
backdoor . , Zhengzhou Bei Dynamics .  
?"

Kali . — , Carla , , WiFi  
, . 3 200  
.

," Kali . " ?"

"Beach . . ." Carla . "  
."

. . . .

. Max . TV , ,  
. Carla . Beach . Beach  
.

" Atherton ," Beach .

. Beach . 15, , , 40 ,  
Stanford 3 . . . 800  
30 . 20 .  
"Kali." .  
. Max — Beach ,  
. . . .  
.  
", Beach."  
. . . — .  
.  
Carla . . . . Max  
. . . . .  
", Beach . " ."  
", Kali .  
"WebU ."  
" Beach . 20 1 ."  
" 1 2." . " ?"  
Kali . — , , — . Backdoor. : INFO, PEEK,  
POKE. Bell Labs C , , 50 embedded processor compiler  
. — David , Steve , .  
. 1 14 node.  
Beach . , . 1  
.  
"Doyle?" .  
"Doyle backdoor . . . .  
."  
"NSA ?"  
" , ."  
Beach . — Atherton , .  
" ?"  
" . — 6 . — , PEEK  
. Bei Dynamics ."  
"Sheng ."  
"Backdoor chip Zhengzhou . Backdoor .  
. . . PEEK ,  
compiler silicon ."  
Beach . Max — . Beach VC  
. . Kali NSA . WebU

. . 1 .  
" ," Beach . " . . Carla ."  
Carla .  
" — . . Snowden . AWS NSA  
backdoor . " . " ."  
" ," Kali .  
" Sheng." Beach . "Sheng ."  
"Sheng Beach ."  
"Sheng . WebU 30 Bei Dynamics 100 . Zhengzhou 40 .  
. . "  
" . "  
" . ." Beach . Woodside . "Sheng  
backdoor . backdoor .  
. . 90 ."  
" 6 . ."  
" Sheng . Sheng ."  
Kali . — . Max  
. David .  
. . .  
" ," Kali .  
" ." Beach . , . . "  
."  
. . . " — backdoor —  
. WebU ."  
" , Beach."  
. . . Beach — ,  
. .  
"Zhengzhou?"  
"Zhengzhou. Sheng . , Sheng ."  
Carla . " . Devi . Dershon Salinas  
. Beach, 9 CSS . Zhengzhou Devi  
—"  
" ," Beach . " ."  
Carla 3 . Max . Kali .  
" . 2 3 node. San Jose , Zhengzhou ,  
?"  
Kali . , . "FAA . Bell Labs .

24 . Zhengzhou  
."  
Carla . " 48 ."  
Beach . Stanford . , ,  
.  
" , Kali."  
" . ."  
" . " Max . " . ?"  
" . "  
" . . " Beach Carla Kali . " — Sheng  
 . Sheng . . . . "  
" ?"  
"Sheng . . " Beach . . .  
.  
" , " Beach . " . "

## 22: Bei Dynamics

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40 Kali .  
1,200 , , .  
— —  
.  
.  
Gulfstream G650 .  
20 PEEK — Honeywell Primus Epic  
, , , backdoor .  
. . ISR . Beach  
.  
.  
—  
, , EUV  
.  
.  
" , " Beach .  
.  
"fab ." .  
"?"  
"3 . EUV 400 .  
."  
Beach . .

...

Bei Dynamics 11 .  
Kali . : 40 ,  
. — , . fab . ,  
ISO Class 1 .  
.  
.  
Mercedes S-Class . . Beach Kali ,  
Carla . Carla Max Menlo  
Park Doyle .  
Max. Kali . , , 64  
.  
" . " . Max Beach  
, Kali

Mercedes . . . .  
 : . . . .  
 7 . 8 .  
 — ASML EUV , 180 13.5 0.03  
 . .  
 . Bei Sheng .

. . . .

. 57, , 20 1 . —  
 , Stanford, Beach  
 .  
 "Kaliya." . . . ."  
 ."  
 " ."  
 ". 2008 . Beach WebU  
 , . . ." Beach ."  
 ."  
 " ," Beach .

Sheng . . : , , , . Kali  
 , . . .  
 . .  
 fab . .

Kali .  
 400, 80. ULPA . EUV  
 , . :  
 , , —  
 .

Kali . . — ,  
 , CVD . . .  
 "3 ," Sheng . " - ."  
 " ?"  
 Sheng . . . .  
 " . . ."  
 " ," Kali . " . "

. . . .

7 . ,  
— 6 — Bei Dynamics  
DNA.

Kali KLA Teron 640 8,000 .

"backdoor ,"

Sheng . .

"RTL . .

— NAND , , , .

. — 0xFE INFO, 0xFD PEEK, 0xFC POKE.

."

Sheng . " ."

"11 ." — . "2016

. 14 .

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" ."

" . " "backdoor — , .

. compiler EDA

."

" ."

" . " Sheng .

— . " . , .

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" ."

" . . , ,

48 Bei Dynamics . " . " backdoor .

. ."

Beach . . .

Sheng .

Sheng , . Kali , ,

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Kali backdoor .

Sheng .

. . . .

Sheng . 8. . — , Kali ,  
. . .  
, , fab . 2,800 .  
Sheng , .  
" ?" .  
Kali . . Beach — .  
" . 2013 .  
. . ."  
"Bei Dynamics HPC." Sheng . "NVIDIA H100 1 2 . . ."  
" ."  
" backdoor . . . recompiler  
."  
. fab . .  
" , " .  
" . " Sheng . " . "  
Beach . Kali , —  
. .  
Sheng .  
" ?" .  
Sheng . " . "  
" ? "  
" . , , . . .  
backdoor . "  
" ? "  
" . . , RF ,  
PEEK POKE — . . .  
."  
. Sheng . . ,  
, backdoor — , , . backdoor . backdoor .  
. .  
" , " . . . .  
" . backdoor . . . . "  
Beach . "Sheng —"  
"Mitchell." .  
. " . . . 4  
. . . "  
Kali .

" . ?"

. . . . ,  
,  
.

," Kali .

." Sheng . . fab

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Sheng . . .

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— .

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.

" 7," Sheng . " . . ."

. Beach . , — , ,  
, 2,800 .

Kali .

. , . backdoor .

. 23,000 node. Sheng HPC

48 , Kali — ,  
node . mesh . . , 100,000 .

Sheng .

.

. . . .

Rana .  
    , 6 .  
    , USB

11 14 . . FBI NSA.

"Bhatt . ."  
    . . USB —  
    .6, , .  
    . .

Steve 9 .  
9 : , Rana USB . ,  
    , White Oak FDA . Holy Cross Kali  
    . (Teams)

. . . .  
    . . , 40

0503 . NIST . . , .

5 . . . , .

314. . . .

. 9 ( , NHTSA , ,  
CPSC ) , . . CO

Steve . . . .

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.  
Kali .

. . .

Signal . Tor ,  
firmware PEEK node . Steve , 6  
NIST WiFi .  
11 .

KALI: .

9 .

KALI: NIST Node 22,847. 4 . mesh .

.

STEVE: ?

KALI: Zhengzhou. Beach Sheng . 4.  
. compiler — geometry .

STEVE: Node ?

KALI: 20 . Sheng , metacompiler  
. ?

. . .

STEVE: 314 . .

. . . . .

.

KALI: ? ?

STEVE: 7 1,100 1,400. . CO .

.

14 . Kali .

KALI: Bo . . . .  
?

STEVE: 18 3~4 10~12 .  
40% . 1 70% . .

KALI: . POKE. compute payload

. . . . .

Steve wetsuit . 9 . Holy  
Cross Ambu .

STEVE: Kali. backdoor backdoor .

. . .

STEVE: . NSA  
. . NSA . Doyle  
... .

STEVE: ?

22. .

KALI: .

STEVE: , . Doyle — . Bo  
. . .

KALI: . 1,400 .

STEVE: . payload ?  
3 ?

KALI: payload . . . .

STEVE: Bo . 7 . .  
. ?

12.

KALI: .

STEVE: ?

. . . .

Kali Sheng , .  
. . 3 .

backdoor .

, Nest , node POKE Steve

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. . .

KALI: . " " NSA . . . .

. , . payload

Bo .

STEVE: . . .

KALI: . .

STEVE: .

. 64 ARM ,

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KALI: ?

STEVE: 8 .

KALI: . . — . . ,

. . . . .  
. . . . .

STEVE: compiler .

KALI: . C compiler — Bell Labs, 1970. compiler  
compiler . compiler .

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. . . . .

STEVE: Thompson . " ."

KALI: . compiler . 1970 . compiler

. . . . .

STEVE: ? .

KALI: . — .  
. . . . .

STEVE: ?

KALI: metacompiler. . Bell Labs . .

.

KALI: metacompiler . backdoor . backdoor  
metacompiler . . . . .

STEVE: . .

KALI: . — .  
. Doyle backdoor backdoor . . Bo backdoor  
. . backdoor backdoor . — .

, . . . . .

STEVE: ? .

KALI: . . . . .

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Steve .

,  
. Cisco node.

. SEAL :

AK ,

: . Kuhn 60 .

— — .

"" "" , . "

" " " .

Kali .

backdoor 50 , .

STEVE: . . . .

KALI: . . .

STEVE: . . .

KALI: .

STEVE: Doyle 3 Holy Cross . , , .

Drager . . . . Rana . 66,

CDRH. 47. — .

KALI: Rana . .

STEVE: , MAUDE , , 6 . Doyle , .

6 White Oak . . . —

, . . 72 . Rana

65 . 4 .

KALI: .

STEVE: . Rana ,

—

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KALI: Steve.

STEVE: Doyle . . . , . 6 . .

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KALI: ?

STEVE: . Bethesda , . . Doyle

, . .

6 . Zhengzhou Kali . Steve

.

KALI: . . Doyle

# 24:

Bei Dynamics — . Kali ,  
 , WiFi Bluetooth .  
 . . Sheng ,  
 . EUV , 13.56  
 .  
 . , .  
 Sheng . Cortex-A78 . KLA  
 :  
 . . , Beach  
 .  
 . — metacompiler , mesh , — Bei Dynamics  
 . AMD, Qualcomm, MediaTek mesh node. Sheng .  
 . node firmware ...  
 .  
 17 38, node . metacompiler  
 . — , .  
 . . Bei Dynamics node . , , .  
 . : . : . node firmware: , . firmware ,  
 , PEEK .  
 .  
 Sheng Bei Dynamics non-Bei-Dynamics  
 . — , 48 , PDU  
 . Sheng Cortex-A78 .  
 . — PDU  
 .  
 Bei Dynamics .  
 . . —  
 . .  
 . AES . Sheng  
 . .  
 . . Sheng

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— Paso Robles , Echo Dot USB ,  
. . Sheng .

Kali NSA . . ,  
. Sheng — , RF ,  
— , .

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. . . metacompiler , , Sheng

— , David

, PEEK . . .

— , .

. Sheng .

, , 1.4 . Bei Dynamics

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Steve .

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( , ) . . .

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20 node . : Xbox, ,

. , , . . .

. Steve : , .

. . Steve .

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KALI: Steve.

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STEVE: . Bethesda .

KALI: . . . .

STEVE: ?

KALI: . . .  
. . .  
STEVE: . . .  
KALI: ? metacompiler . . .  
. . .  
STEVE: "" ?  
KALI: metacompiler . . . , . . .  
. . . node . . .  
. . .  
STEVE: . . .  
KALI: . . .  
STEVE: . . ? ?  
KALI: . . metacompiler ,  
. . .  
STEVE: ? . mesh .  
compiler ?  
. . Steve . . .  
KALI: . . .  
STEVE: . . ? 20 node . . .  
JTAG . . .  
KALI: . . — . . .  
. . .  
STEVE: , . gate  
?  
KALI: . . .  
STEVE: . . .  
. . .  
KALI: . . Doyle . . Bo  
. . . Doyle : . Bo :  
. . . , . . .  
STEVE: node — ?  
KALI: . . . metacompiler ,  
. . .  
STEVE: . . .  
KALI: . . .  
. . .  
STEVE: . . .

KALI: .

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STEVE: . . . .

KALI: . . . .

STEVE: . . . .

KALI: . . . .

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. . . .

Steve . . . .

metacompiler , . . node . . . .

. . . . Kali. . . . B

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David . . . . : ?

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# 25:

Bei Sheng 1 7 .  
 3—Beach Kweichow Moutai , Sheng , 1 2  
 1997 , Beach . 5—Kali ,

Sheng . ,  
 . , firmware , backdoor . —  
 , interrupt service routine .  
 . ARM Cortex-A78  
 backdoor .

Sheng . — ,  
 , . . . Bei Dynamics  
 — 3 4 , 194 , interrupt  
 service routine .  
 . Kali Zhengzhou ,

. Kali — ,  
 , . Sheng .  
 , , firmware , backdoor .  
 — , .  
 , , . .

. — PEEK,  
 , POKE. ,

Sheng . . .  
. . . 1 50 . . : 11.  
TOP500 3 .

. Sheng . Bo — .  
Bo . Sheng .

. Wei Lin — . . . , Tsinghua ,  
8 TSMC Nanjing . Bei Dynamics —90  
R&D 430 . . . .

" ." Wei Lin .

Sheng . "?"

" . Cortex-A78 . 2 22  
40 . Beach ."

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" . 9 47 11 ."

Sheng . 11. —

" ?" .

Wei Lin .  
. Kali — , , mesh ,

" ." Wei Lin . . .

"?"

" — . . : 72.  
—" . . . " Bei Dynamics  
1 45. 10 6."

Bei Dynamics 10 1 7 . . : 18 FLOPS. Oak Ridge,  
Argonne, . . , AI , —

— . 2027 .

Amazon . Google . Apple .  
. . . 90 .

Sheng . . , .

Sheng . . . .

" ." Sheng . "3 ."

Wei Lin . , , . .

" ." Wei Lin . " . . . .

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" ," Sheng , "

, ."

Wei Lin 2 . Sheng Sheng .

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. . . .

Sheng .

. Beach — ,

. Beach .

Beach . Woodside Kali Sheng —Sheng

. Sheng . .

Beach . Beach .

Sheng Kali . Sheng Kali 90

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12 17, Sheng . Bei Dynamics , Lenovo ThinkPad— , Zhengzhou

, .

— , Bei Dynamics

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. . .

Grigoriev — , ,

140

, . Sheng 7 Grigoriev .

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11 Zhengzhou . , 7 , 5.

. 60.

, . Grigoriev " " — 3

Kali . Sheng . .

. 1.3 . . Bo .

Sheng . . . ,

Sheng . . . —

. . . , .

Kali . . .

Bo — , Bo —Kali

. . . . Bei Dynamics

. Sheng .

Bo —Kali , , — .

, Sheng .

node Bei Dynamics . . . . Kali

, Sheng .

R&D . . .

backdoor ?

Sheng .

backdoor . . . . Kali .

. Sheng backdoor . . . firmware .

, compiler . Kali backdoor ,

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Bei Dynamics .

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. — , 17

. . .

2 — , , 6 .

Zhengzhou . Henan — ,

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1968 — .

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Kali . . . backdoor

. . . .

backdoor . . . .

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60. , Kali , Bo , Sheng , Sheng

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, 17 Kali —Wei Lin , 48

— . . . . .

17 node. Kali —

. 1480 , Sheng .

1 , .

Kali — ,  
. Sheng , , 8 5 ,

Kali . , , mesh , .  
— ( , ) ,  
backdoor .

Bei Dynamics .

Sheng . . —  
24 , 11 ,

. . . .

## 26:

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Max 3 47 .
. . .
1. . . — . 11
. 11 , ,
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— ,
.
"Kali."
. . . 5
node . — , go-bag .
" . , , . , VHF,
4 ."
"?"
" . Bo ." . "WiFi .
mesh ."
Mesh. 25 node. Kali . 700
6 . — , ,
— .
"Beach?" Max .
"3. . ."
. — Max . .
. Max . Kali
.
"Carla?" .
" . ."
Max go-bag . — , 40
3 . . .
. — LED . . .
. , . . .
.
"Sheng," Kali .
```

Max . Sheng . Sheng . Sheng .  
Beach : Sheng .

" , " Max . " . "

. . . .

. Max , , Maglite . Kali —

, . .

" . 2 . 3 . "

Max . , , .

. — .

. , , . 5, Kali .

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" , " Max .

" . "

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. 3. Beach , . . . .

"Beach , " Kali . " . . "

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". Mesh . . "

Max . . . — . 20.

. Max . , , ( ,  
) . .

Kali . — , ,  
. . mesh .

" ?"

Kali . . . . .

" . Mesh 17." . . . . .

" . Beach — "

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"Beach . . . . "

" ?"

" . Node 847,291. . " —

, . " . . . "

Max . Beach . , Zhengzhou

, 8 —

. . . .

" ."

" . . . — . Beach ,

." " . ."

. . . .

. Kali Bei Dynamics — 110 ,  
EUV , mesh node . —  
11 — , .

"Sheng ,," Kali 3 7 . "40 .  
. ."

"Sheng ."

"Sheng . , , .  
. Bo ."

. SUV, , 40 . Max  
. Huron Sprinter .

," Max . ."

"Carla . . 3."

3. , , . Max  
— ,

. 6 —  
. — . — Kali

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— . , 3  
. 2 . .

SUV . . . .

"1," Kali . . ,  
. " . Carla mesh ."

Max . SUV 500 , , . —

" ."

." Kali . .

SUV . . , , GPS, , .  
— body control module POKE 0 . SUV  
200, .

Max .

"2024 Hongqi E-HS9 body control module Chevy Silverado OnStar ARM Cortex-M7  
," . " Bell Labs . . "

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. . . .

Gulfstream — Carla , .  
— 50 , — .

Max . . . .  
, .

Kali . — , Honeywell .  
. " . Zhengzhou Ürümqi.  
."

"?" ..

"Tokyo. Haneda. Carla ."

. Gulfstream . Max Bei Dynamics  
— 11 . Beach .  
Sheng .

Beach. Beach .

Max . . . .  
. POKE 20  
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Max . Zhengzhou — 1,200 ,  
, Sheng Bo , Kali .

Kali . . . . ,  
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" , " .  
"?"

" . Beach . . . . "

Max . David . ,  
Cabrillo Highway David . Beach . Beach Max  
Zhengzhou .

Gulfstream . . . .

" , " Max .

Kali . .

" . "

" . " go-bag — , , . .

*METACOMPILER*

. Balboa Street David

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27:

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James Doyle Dr. Steven Foster Bethesda Federal Credit Union .

Old Georgetown Road CVS Suburban ,  
. . . , firmware,  
. FOSTER, STEVEN R. — DR. . . ,  
, FDA , , , .

Doyle .

. . Veridian Medical Technologies Foster Annapolis 94,000  
— FDA . Atlantic City ,  
Foster Rebecca Cline. . . , Foster

Foster , Veridian 510(k) FDA . . .  
. . , , SEAL

Doyle . . . .  
. Foster . Kali Devi .

. . .

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. Bhatt Chakrabarti ,  
. Doyle . . 505.

Doyle . USB , , FOR STEVE —  
ONLY IF — . . .

. Foster , .  
. Doyle

. , , — .

Bhatt .

Steve — , . : MAUDE , ,  
, . 2027 1 1,847. Doyle .  
. backdoor NSA . : UMBRA. . . — R.

Bhatt . . 2 1,823. .

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Foster 8 56 . , . , , .

. : , , .

Suburban . Doyle CVS , .

Foster 9 4 . Doyle . , , ,

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9 11, Foster . . . .

. , . .

Doyle Suburban .

Old Georgetown Road , Foster .

. . . .

"Dr. Foster."

Foster . — , .

.

" James Doyle. " . " . "

Foster . SEAL . .

" ." Foster .

" . . ." Doyle

. " . . . "

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. . Doyle .

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"Veridian Medical Technologies. , 94,000. 2025 9 14. Annapolis Atlantic City . ." . . "Veridian 510(k)

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Foster . . , .

" . . . 18 201,

. 5 15. OGE-450 . 5."

" . "

" 6 . Kaliya Devi  
 , backdoor  
 ."  
Foster . . SEAL .  
"Rana ?" Foster .  
"  
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" . ."  
" . backdoor 50 .  
 . . .  
 . " Doyle Foster . "  
 . Bo . . . "  
" . . Bo backdoor . "  
"Bo backdoor . , .  
 . 2~3 . — ,  
 — 10 . "  
" . "  
"  
 . "  
Foster . . Doyle .  
 . .  
" ?" Foster .  
"Kali Devi."

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Doyle , .  
"Devi . , ,  
 — . Bo . backdoor  
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" . "  
" , . — NSA  
 , . "  
" ? "  
" , . "  
Doyle . " . Devi — , ,  
 . Veridian . Bhatt . FDA ,  
 . "

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" . . . Bhatt UMBRA  
. Devi . " Doyle . "  
. Gulfstream , Zhengzhou Beach — .  
. , — , . "

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, NSA Greenbelt Rana Bhatt .  
, , USB , . . .  
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6 — , , —  
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, 8 12 .  
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Steve Doyle . , ,  
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. . . . Rebecca  
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SEAL . . . , ,  
. .  
Doyle .

backdoor Doyle . Steve SIGINT .  
NSA — , — .  
backdoor . .

Kali Doyle . Steve — ? —  
. . . . .  
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node metacompiler ? , , ?  
Steve Ambu . . .  
. .  
. Doyle . . .

Kali .  
Doyle . , ,  
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,  
" ." Steve .  
Doyle . 3. 5.  
" . IG ."  
Steve . .  
"Dr. Foster."  
Steve .  
" . — — . backdoor  
 . ."  
Steve Bethesda . 3 . Old Georgetown Road ,  
 .  
 . Kali . firmware, Tor , mesh node.  
 .  
 . Kali . . Doyle — , , —  
 .  
Doyle .  
Steve . . Suburban CVS  
 .  
Doyle . .  
Steve . . , . Doyle  
 . Rana . . , metacompiler  
Doyle .  
 . . .  
Suburban .

. . . .

# 28:

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4 . . . . . Carla  
. Beach . . . . .  
. . . WiFi . Carla .

Max 7 . . . . . Kali

. . . . .  
.

. mesh . . . . . 30 node.

. Kali . . . . .

. mesh . . . . . Bo . . . . .

Doyle . Sheng . . . . . node,

mesh, . . . . .

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8 30 Max . . . . . Kali

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. . . . . WiFi . . . . .

Bluetooth , NFC , . . . . .

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1891 . 1923 . . . . .

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. WiFi, , . . . . .

1891 . . . . .

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WiFi, , .  
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72.  
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Kali .  
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node . , .  
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mesh . . .  
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Mesh Kali . David  
.  
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,

. (, CAN bus, ,  
backdoor.) . . . Node mesh  
Beach Zhengzhou.

David . . . ,

David .

David.

. Balboa Street David . MIT  
David Asimov . David.

. . . 243

David . , .  
, . Balboa Street , Max 30 David  
, 3 7 Max .

. C NSA

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> > .
. . . .
. . . .
. . . . > .
Max.
> . . . .
. . .
", " .
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. . . .
"Carla ", " " . Beach .
Zhengzhou , Carla ."
. . . .
" . Steve . Doyle . , ,
" Max . " . . . Bethesda .
. ' node '."
Steve. , . Kali . . .
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Kali . . . .
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", " .
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Max . . . . ,
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Kali . . . .
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. . . . WiFi, , Bluetooth, NFC, 1300
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*METACOMPILER*

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## 29:

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 Max . . . ( . . . ) . . . , .  
 1960 1970 . . . .  
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1969 Kibernetika . " " ,  
 V.M. Glushkov, S.A. Lebedev, : A.P. Volkov.  
 Viktor Glushkov. — , Thompson Ritchie Kernighan . Glushkov  
 , OGAS — — .  
 ARPANET . . Glushkov 1982 ,  
 .  
 Sergei Lebedev . MESM — , — , 1950  
 . Lebedev MESM ,  
 . 1  
 von Neumann .  
 MESM. . Kali , .  
 Volkov .  
 . . . . .

. , , : , ,  
 . Kali : , ,

.  
Volkov 4 . — (Thompson  
) , . Volkov  
compiler , —  
. . . , compiler  
.

. 1969.

David Wheeler .

Kali . — ,  
, .

Volkov . 1969. . backdoor  
.  
.

. . . .

5 " ". Volkov compiler . 1969,  
: BESM-6 compiler (Lebedev , ) Elbrus compiler ( Babayan  
). , - .

Volkov , :  
" compiler . compiler , ,  
, ."

. compiler . Thompson .

Volkov . . . , , Bell Labs .

. . . .

.  
1971, Bell Labs . Kali ; Bell Labs  
PEEK AT&T . . Thompson Ritchie  
Unix C . .

Volkov.

Kali . . 1971, Volkov Bell Labs  
. 1972, Thompson C compiler . 1973, NSA — SIGINT Bell Labs  
— . 1974, Multics Thompson  
. 1975, backdoor .

Volkov . NSA . ,  
, .

. . . Volkov . NSA

.

. . . .

. — . Kali

: , Glushkov , . Volkov ,

, , , . Glushkov ,

, . Kali .

. , : "V.M.G., A.P.V., Petrov . , 1972 11.

"

. Volkov , , 1972 11 .

. . , . (Petrov , GRU) compiler

.

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, , : .

. . . Volkov — -

, , .

MAD. . . compiler .

,

backdoor compiler : .

. — PDP-11 Elektronika , VAX

SM-1700 , Intel 8080 KR580VM80A . . . compiler

. compiler . , backdoor —

NSA , .

. . . — , ,

, — . Backdoor MAD

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General Bo .

. . . .

Kali . . , , , ,

: , ,

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Volkov . 1969, , ,

compiler . , , .

, , . , IEEE , ACM

.

Thompson . 1984 , ,  
" " ,

Volkov . Thompson . .

Kali . . , Zhengzhou .  
, Volkov . .

Lebedev . Carnegie Mellon . Thompson . , ,  
MESM

Volkov . Thompson . Kali ,

— WiFi , Bluetooth, . . ,  
, node .

. . . .

### 30: David

.  
Max . . . , .  
. . . Carla . . . ,  
10 . . .  
" , " .  
. . . Panasonic 50 . . .  
" , " . . . " . 1969 . . . , Thompson . . .  
Wheeler 40 , GRU ."  
Max . . 14 . . .  
" ?"  
" . metacompiler . . . " . "  
backdoor 50 . . . . MAD. compiler  
. "  
"Bo ."  
"Bo ."  
Max . . . Panasonic . . . "Beach  
. Carla ."  
Kali . "?"  
"40 . . . Bei Dynamics . . . PLA . Bo  
. " Max . . . Sheng ."  
"Sheng Sheng ."  
"Beach . . ."  
" ?"  
" . . —' node . . .  
. "  
Kali . . PLA Beach,  
. . Beach:  
. .  
" , " Max . . . . .  
. . .

."

Max . . . ( , ,  
.) . . .

Carla .

"Steve Carla . CDRH .  
."

. Kali . ( , , .) Max

" . GRU 6, Bo . Steve Bo  
. , ARM . Steve  
node PEEK."

"?"

" 2026 7 22. David ."

. Kali . . .

."

Max .

"1 Palo Alto, Waverley Street, Devi . David M. Dershon , Lexus ES 350, 2026,  
Starfire Pearl, 8BRK427. 13 47 Devi , Cabrillo Highway . 2 ."

Kali .

"2," .

."

."

"2 . 14 41 POKE, CAN bus . 1  
—" Max . . . "— 1 Devi  
. . ."

1 . Devi . Waverley Street.

David . David . . . .

. . . Lexus ,

2 .

. David Dr. Devi . . .

. GRU



"David ?"

Kali .

," Max . " ."

."

"David ."

". David . David —" . . David .  
David . David .

"David , , David Santa Cruz .  
" . " 8 .

David . David ."

Max . . . .  
. David Dr. Devi . David Max . ,

" , " Max .

."

"backdoor . . . David .  
."

. Panasonic . Tokyo . 1300 , 1300 ,

," . " . ."

Max . Balboa Street David .  
David . David

" , " Max . " . — . , , . .  
. , Asimov ."

Kali . . . .  
, 3 .

"Asimov , " . "112."

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" . ."

. . . .

. Max .

, , .

. : , . 28 .

. . . ( Murphy Oil Soap )  
. . . Waverley Street .

1 —

1990, , Kali Dr.  
Devi —

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. . .  
— backdoor, , — .

. . . .

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. . . , PEEK  
POKE — backdoor , , Waverley Street

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. . . .

6 . Max . , .

Kali . Carla , , .

"Steve." . SEAL , , .

". Doyle 18 . . . ,

."

" ."

". — , , . Max ." . "Tokyo .  
Narita. ."

Kali Max . .

"Carla Keisei Skyliner . . . ."

."

"Steve. . GRU ."

" ."

"David 2. 1."

". . . .", Kali. .

."

. . . .

Max . . 30 .

. . .

"Steve Tokyo ," Kali .

:"

" . Beach ."

"Beach ." Max . "?"

Kiev Volkov . Waverley Street .  
David.

" , " . " metacompiler ."

. . . .

# 31: — Kali

. . . .

mesh .

. Mesh. Bei Dynamics 847,291 — Zhengzhou

— . . . ,

, , WiFi , ,

2 14 Panasonic — , Kali

.

Max .

. . . .

. . . . Zhengzhou

, . . , mesh, Panasonic .

metacompiler —

: (diverse double-compiling), (reproducible build system), metacompiler .

Mesh .

Max. (St. Luke's International Hospital). 11 47 .

, . Steve

. . . Max . 178/104

—

.

Kali . Max . ( , ,

, , ) . Max backdoor .

mesh .

. . . .

520 , .

backdoor . node.

. . . POKE , POKE Sheng .

PEEK. . — Max

3 : , , , , .

. 6. 4 417-B .

Max . 64 — ,

. 152/91. 97. .

. . . : 64,

63, 65, 64, 63. . . , ,

, . . .

. . . . .

. . . . .

3 8, mesh .

1 , — .

Watanabe, Kenji, MC-2847, 7 3. 3

8. Watanabe .

Kali PEEK. : Watanabe , .

433 . . GRU 6.

Bei Dynamics Bo .

GRU .

. . . . . 4

.

Max .

. . . . .

Kali 1 . , , . Steve

— ,

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1. . . . . — 1 ,

. 4,891 ,

PEEK .

Mesh 1 . Mesh . . . .

PEEK. 2 . . . : 1.2. 4

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4 PEEK. , Tanaka Mori — ,

. . , . Max 417-B, ,

.

3 . .

Kali Zhengzhou SUV . POKE —

. . . , .  
. . . : ,  
. . Bo Kali .  
. .  
. Max . Max .

. . . .

Kali PEEK. Zone 4 4. —

. Max .  
4 . . —  
0.3 .

Max . . .  
— . 1.4. . . .

Max .

Kali . Max — ,

. POKE. Zone 4. : 40 — ,

. 4 Kali — , -  
(text-to-speech synthesis), Max Kali

. EM .  
. mesh , , ,

. "Code Seven, 417. Dr. Dershon, Code Seven, 417."

Code Seven. . Max . SFPD. Code Seven: . : .

. Max . .

. . . .

. Max 63 88 . . .

, Max — , .  
Max 3 9 . : .

. . . Max . . . ,  
. Nihon Kohden —

417-B . . . GRU .

Kali POKE. — Watanabe, Kenji, MC-2847 — AMAG  
. . . : 01() 00() .

. Max 415 . . . ,

. . . . . AMAG  
— .1 .4 . . .

. . . . .  
— . . .  
. . . . . 1.4 . . .

Kali . . .

. . . —  
, . . . .  
. . . . .

1 , . . . , Max . . .

417-B . . . . . ,  
— Max . . . , 1 . Kali 4  
PEEK . . . . .

POKE. — . . . .  
, . . . . .

mesh . . . , PEEK . . .

" . . . . . "

Steve . . . . .

### 32: — Max

Max David .

. . . , —  
. David Balboa Street Foundation : "  
?" Max ( , ). David

. . . , Max .

"Code Seven, 417. Dr. Dershon, Code Seven, 417."

Code Seven. SFPD . . . : . . . .

Kali .

Max . — ,  
— Nihon Kohden 417-B flatline .

IV . ER 125 .  
. . . , .3. .

. . . , — Velcro —  
. . . . ,25 ,

? Steve : , , Carla Shinjuku

San Mateo , Topeka , .

. . . ( , , )

. . . — Steve , Kali  
David GRU .

417-B . , , ,  
. Max .

, . Max .  
, — , , —

Max . . .  
. : , , , LED

3 2 . , . 4.  
. Max , , . .

. . , Max . , flatline . .  
: , , , ,

. , . 2. 1. , , ,  
. . . .

. , . Max Tokyo  
, .

Max , , .

"Shinjuku," .  
. Chuo-dori , Max —

, 520, , .  
. . ,

, . — 14  
. . . .

: Kali . SFPD ,  
 (Dershon — "Dr. Dershon" , David  
 ), . . . , .  
 Shinjuku , , ,  
 , .  
 Max .  
 — , , .  
 David . David Max .

. . . .

3 31 Shinjuku . Steve , , , . Kali  
 .  
 " , " Max .  
 " . " Steve Kali . " . "  
 Max Kali . , Panasonic , ,  
 . . . ,  
 . . . .  
 " , " Max .  
 " . "  
 " . "  
 " . 12 . . "  
 " . "  
 " . . . . "  
 Max — , , .  
 Kali . ,  
 , , .  
 Shinjuku 4 .

. . Steve . Max .  
 "Bo , " Max .  
 "Bo . . " Kali . . . "  
 GRU . Zhengzhou . Bo  
 — Beach Zhengzhou, Tokyo."  
 " . "  
 " . " Kali . — ,  
 . " . . . 7 . NSA,  
 , Sheng. . . "  
 Steve . . BUD/S

.  
" ?" .  
"metacompiler. . . . Volkov .  
 , , . node . . .  
."  
" ?" Max .  
" ." . — Zhengzhou —  
 . "Beach . Steve . Max .  
compiler."  
Max Tokyo . . . . .  
.  
David . Max . David ( , , ) —  
Max , : . . .  
 . .  
" ; " Max . " . "  
Kali . . .  
" . Cathedral . . . "

. . . .



, Apple .

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. . . . .

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: , . . . , :

AES-256-GCM. NSA . Doyle .

: , . , : VHF, 148, Kuznyechik .

. Bo . GRU.

NSA . GRU . . . . .

.

. CCTV — , Panasonic i-PRO , GCC 9.3

Linux , backdoor . --

.

Liberty Tower 4 .

, . . .

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. WiFi . . VHF . . .

...

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3 11 47 .

.. : , , . 8.

. — , —

.

NSA . Samsung KDDI , VPN

. , FamilyMart . . . .

...

. , — WiFi

TOKYO-KASAI-3F — . . . . .

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Kali .  
 , — 4 ,  
 , — .  
 .  
 . Kanda . GRU . VHF  
 — . ,  
 . . . .  
 . Marunouchi —  
 1,500 3 . . . .  
 Max .  
 . , .  
 . VHF .  
 .  
 . .

. . . .

Max . . . . Kali .  
 . . . .  
 Steve . — Steve , Max  
 . Steve Doyle .  
 Maryland Max .  
 Max .  
 St. Luke's — . . . .  
 . Kali , Max .  
 : , .  
 . . , .  
 ," Steve .  
 " ."  
 " , " Steve . " ."  
 " , , " Kali . "Doyle Samsung Galaxy S23, Bo  
 Xiaomi 14. 06:14 . . . ."  
 Steve .  
 Max . . . . .  
 . . . . .  
 .  
 Kali . Panasonic , .  
 "Beach , " . " ."

Doyle Steve . . . MAD.  
backdoor ."

" , " Steve .

" . " . " . — ,  
. . . mesh ."

" ?" Max .

"metacompiler . Volkov .  
. . . mesh node , mesh .  
. INFO, PEEK, POKE — . ."

" , " Steve . " node."

". backdoor . backdoor node . , mesh .  
."

. Max — , , , Panasonic  
— David .  
David. David.

" ?"

. . . ,  
,  
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" ."

Max . . . Carla . , ,  
.

"Max. . . . ."

. Kali . , , .  
node mesh .

Max . . . .  
. . .  
.

. . . .

### 34:

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Kali 3 . . . — , .  
: , ,  
WebU . . .

Carla . . ( 1,600, )  
WebU . . . 2019 . WebU ,  
, . . .  
. . . — ,  
. . .

. 3 , , ,  
. 1 : , , Max .  
. . . , . 4

Carla . . , Zhengzhou Gulfstream .  
, JASDF , . . 6 14 . . Max  
— Max . . .  
— .

Kali . . mesh ( node ) . . , . mesh

...

Dell PowerEdge R740 — . . , ,  
. Carla — Beach, WebU, Doyle Bo

: . . . , ,  
. . . , , . Kali . . .  
firmware .

Steve . . — , Carla  
. 3 — Kali  
, , . . . . .

" , " Kali Steve .  
 , . "3, 200, 50. . UPS —  
 . . "

" . " Kali . . — ,  
 . . . . .

4 9 . . . . — ,  
 . . . . .

" . "

. . . . .

. , . . .

. Thompson 1984 : compiler —  
 compiler — , .  
 compiler compiler. compiler — C, C++,  
 Rust, Bell Labs .

Kali .

Alpha: . . — ARM A64 , compiler linker  
 16 . 16 . .

C compiler. . Steve .  
 Bell Labs . Thompson . .

Beta: Volkov . NSA 1978 Kali PCC(Portable  
 C Compiler) C compiler. Volkov 1978  
 Ritchie 1972 PDP-11 . . 1978  
 1972 , . Zhengzhou Sheng .

. . Alpha metacompiler Beta metacompiler  
 — , — . . Volkov  
 , Wheeler , Kali .

. . . . .

Max 7 30 .

. : . . .

. , . .

Max — Abus Granit, , . .

, .

: , . , .

. — , ,

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. : , , : , ,  
— . 1 . Max . 2.  
. . . .  
— , , .  
. : . Max —  
, . . .  
. Max :  
, . . . .  
. 3 , 1 . . Max :  
— . . . .  
. — — ,  
. St. Luke's . . . .  
8 15 , , . . . .  
. . . .  
Max . . — , . .  
. . . .  
3 Kali .  
4 — , , 16  
. . . . .  
compiler , .  
. . . .  
Max David . David, Balboa Street Max 64  
PEEK POKE . PEEK: . POKE: . David 10 POKE 53281,0  
— — Max , " ."  
POKE 53281,0 . VIC-II 0 . .  
David , , . POKE 0xFF.  
. . . .  
Max Kali — —  
, . . . .  
Steve 11 40 .  
. . ( ,  
, Kali ) Kali . Steve .  
. . . .  
: , , JTAG , backdoor

```
. JTAG .  
. .  
, compiler .  
Steve . Kali . Steve . . " , " .  
. .  
. . , JTAG  
. . . Alpha Beta . .  
. .  
. . metacompiler .  
. .
```

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```
, Steve 1 .  
. . — ,  
Bethesda .  
. . . . .  
. . , , , . Steve  
. — , , . 3 .  
Kali 4 . . . . .  
. .  
. . — .  
" , " .  
" ."  
. .  
Steve — , . . . .  
: , . . . .  
" ?"  
. . — .  
"mesh , " . " — . . . . ?"  
. . . . .  
" , " . " . — . . . . "  
. " . . "  
" ?"  
" . . " . " , Steve ."  
" ."  
. . — . . . .
```

. . . . .  
.

. . . . .

Carla 2 17 .

, Iridium 9575 — . Kali firmware  
PEEK. Motorola 68000

### 35:

.....

Beach .

Kali . ,

. Beach . , . ?

? ?

Zhengzhou, Bei Dynamics 9 3 .

: WebU 70, 8,400 . Fortune 100 .

. WebU — ( Kali  
, ).

: . . SEC . . Carla,

Sheng , .

. . WebU 2.3 . .

.

. Bei Dynamics PLA . Sheng

. . Bei Dynamics Sheng , PLA . Sheng PLA

. Sheng . Beach .

Beach Sheng .

Beach . . . .

. Kali , Sheng Beach

, Carla .

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6 14.

.....

General Bo Beach .

5 8, . , .

. . GRU

.

Beach . . Rye, New York 4 .

"Mr. Beach." . " ."

"Sheng ."

"Sheng . . ." Bo . . . . "

."

Beach . Kali . metacompiler . Bo . Carla  
air-gapped .

"," Beach . "backdoor . . . . "

" . ." Bo . . . . "

. . . . "

" . " Beach . " . . . . "

Bo . . . , . . .

" , . . . Kali —  
, Mr. Beach, — .  
."

" . "

" . . . 3 air-gapped . . . .  
. . . ." Bo . "  
, Mr. Beach. . . "

Beach . . . .  
. . . . ( , , , )

.

.

Kali . Sheng . Doyle . . .  
Bo , . . .

" . ." Beach .

Bo . . Makarov PM . . . .

.

" , " Beach . " . "

Bo .

" . . . , WebU  
20 , , . . .  
compiler . . . ." Beach . Rye, New York Beach  
. . . . "

."

Bo — 1, . Beach .

."

" 1 . . ." Beach  
. " Kali . . . . "

. GRU , . . . .

Bo . Beach — , . Beach

. Beach .  
 " , " Bo .  
 " . 48. 11 ."  
 Bo Makarov .  
 "  
 . " Bo . " . "  
 Beach . Bo . Carla . Kali .  
 , — .  
 " , " Bo . " . , . "  
 Bo . GRU .  
 Beach . . . 2012 Palo Alto . 20  
 .  
 , . . .

. . . .

3 47 .  
 Carla . . Max . Osaka , Carla FBI  
 . . .  
 "Beach . . PLA , Bei Dynamics 9. , .  
 . "  
 Max . Iridium — Osaka 780  
 Hokkaido 4 1 . 4 1 Woodside  
 " " Beach . Beach  
 . .  
 "?" Max .  
 "Makarov . . Bo . . " Carla " .  
 FBI , . . .  
 , Osaka 600 — — Carla  
 . . . FBI , ,  
 . Beach . Beach FBI "  
 " , , . . Zhengzhou  
 . . Beach .  
 .  
 . . . .  
 Max Steve . Steve . . .  
 . . . .

```
Max Kali .
Row 4, Position 9 . . . . .
"?" Kali .
"Bo. ."
. . . , , Kali .
.
" ." Kali . . " node ."
Steve Kali . . . . . ,
.
" ." Steve . "Beach . . ."
" . . ." Kali . . " . Palo Alto
    20 , —
    . ."
Max Iridium Steve . . . . . ,
. . . . .
. Max Beach David
.
Beach Woodside Kali . WebU . . .
2011. Beach Los Gatos . " . ."
Kali Max . Shinjuku , , . Beach
. . . . .
. Kali .
" ." .
" ."
" . ."
. . . . .
.
80 node . , ,
. 110 firmware .
. 80 — . mesh .
, , secure boot IoT . .
. TPM POKE firmware .
. . . ,
.
. metacompiler — interrupt service routine
— . ARM Cortex-M4
Intel Atom firmware . Qualcomm Snapdragon PA Renesas
```

RL78 firmware . . . .  
 , firmware , .

Kali 847 . . . . Toolchain Alpha Toolchain Beta  
 . . . . — Bo

110 847 — mesh .

80 node . 8 4,700 .

" . " .

Steve Max . Steve Kali . Max

.

"mesh . mesh . mesh — ,  
 , —

### 36:

Kali 72 4 9 . Max . Bifuka Family Mart ,  
, .90 .  
. — — .

Toolchain Alpha. 16 C , .  
10 847 .  
. JTAG ARM A64 . Steve  
. Kali 16 ,

Toolchain Beta. 1978 Waterloo PCC , Kali Zhengzhou  
. . . . .  
. Kali , , .

6 .  
Steve JTAG . Max . Hokkaido  
6 . 400 . ,  
, .  
Max Kali . . ,  
, . .  
" . " . . "  
" ?" Steve . " . . . "  
" . 847 .  
— , , .  
. mesh . mesh  
847 . "  
" , " Steve .

" mesh . . mesh . 847  
. toolchain . Bo ."

Max . . . 3 . Kali  
14 . . .

" ?" Max .

"Steve . . . . EEG .  
— . . AED .  
90 , ."

"90," Steve .

"90 . mesh ,  
. 90 ."

" ?"

". .  
. — . . . 90  
. . . 60 . 2 .  
— ."

Steve . . . . .

"EEG," .

. . . .

4 .  
. , , . ( . Zhengzhou  
) , , .

. , mesh .  
. 80 node .

Steve EEG . Kali ,  
. . : 10 , ,  
. 68. 118/76. 14.

Max 4 . . . . Kali

"," Steve .

Kali . . . . .

. . . .  
. . backdoor 127 . 7.

. . . .  
. , , .

. . mesh .  
 mesh . 80 . Kali ,  
 . node , node  
 . . 55. 60.  
 70 . 75. 80. .  
 .  
 847,331 .

. . .

Kali . . 85  
 .  
 22 . 85 .  
 . 85 22 , .  
 . Kali . .

" 94," Steve . " 138/92. EEG — ."  
 . mesh — , , —  
 . , 40 , mesh  
 3 .

— , , Hokkaido . mesh  
 — 39 85 node. , , . Tokyo.  
 Mumbai. São Paulo. Lagos. Berlin. Sydney. Reykjavik. Johannesburg —  
 mesh — Kali .  
 , , —  
 . Osaka . . .  
 Bo . — , , 11 11  
 4 .

Kali . POKE . 3. .  
 . .  
 , .

David . POKE. . 3.  
 mesh . . .  
 . 68 94, 112, 80, 130. .  
 . mesh — node — 72 .  
 . . 72. mesh .

" 72," Steve . . "mesh ."  
 . . . 22  
 85 . .

"EEG , " Steve . " . — , , .  
... "

Max . . . , , ,  
.

David . 40 UCSF Marie. 19 . David —  
, Marie , , .

. Pettit Lexus David . , , .

. David . Kali .

. . . Max . . . .

. . . .

90.

" , " Steve . " . . "

Kali . . . . Steve .

— . . . . 11 .

Kali . .

.

. , . —

— . . . .

. 39 85 , .

" , " .

"?" Max .

"Bo." . . . . 72 — mesh . EEG

. . . . "4 GRU node

. . . Sakhalin . 300."

"\_\_"

" mesh . node . . . . Doyle NSA

Okinawa . . . "

Steve . " .

— mesh . 85 . "

" . . — Zhengzhou ,

. . . " Bo

. 4 — . . . .

."

"?" Steve .

" 48 . , , 6 node

. " Steve . mesh , ,

. Max . , .  
"3 , " . " . "  
toolchain . Alpha Beta. 11 .  
. . toolchain . .  
847 .  
. .  
" , " Steve . " . 847

### 37:

Bo 40 .  
1973 . 3, , 2 20  
. . Bo

. , 150 ,

Orlov Bo . 40 , ,  
, . Orlov  
. Orlov . Bo .

"," Bo .

" . Liana 14 . 6 . ." Orlov  
." : 847 23 . — 4 7 , 89 ,  
120 . — CAN bus 3 4 . — 14 , HVAC  
89 . ."

Bo . , ,  
. . , ,  
, .

"," Bo .

" . Bifuka WebU . . . .  
." Orlov . " . 14  
— mesh .  
. ."

" ."

."

" ."

" ."

Bo . 30 Orlov . " .  
backdoor . 50 — —

. , , ."

" , " Orlov . " . . "

" . . , mesh .  
. . . backdoor  
. . . "

Orlov . . .

Bo . — . . , ,  
. 40 .

Yelena . . 2 , , Stravinsky  
. 21 . . . — ,  
. , Dvořák ,

. . , , .

. . .

. . . . .

backdoor — Kali —  
. . Sheng . 10

backdoor , , , ,

. . , , ,  
. Yelena . Yelena . Yelena .

. . . . .

. . 1945 8 6 . Bo

backdoor . . . ,

. . , , .

Bo . 3 6 , .

. . . . .

" , " Bo . " . . . "

. 847 , ,

POKE , 14 6 .

— , WiFi , Bluetooth — .

POKE . . . . .

. . . . .

. . . . .

. . . . .

. Steve 2 Dräger Evita V500 14:22:07 UTC

POKE — , , VLAN ,

backdoor , .

. FiO2 40%( ) 100%( ) . 4

. 8 Charité ICU . 12 .

15 . Kristin Bauer — , 10

Wilhelm Hoffmann , 3 .

— . Dräger Dräger , Dräger

. Kristin Bauer

60 4 7 .

Bo

, POKE 6

David Dershon 9 97 . . POKE.

14:28 UTC, 3 4 . . , ,

. 12 . 4 , , 6

20 , , C1 3.2

847 . 90 214 .

405 Sepulveda (8, , 1 1 ) .

Bo . . . . .

"1," Orlov . " . 2: ."

."

James Doyle NSA Fort Meade 3 OPS2A .

. , ECHELON ,

Doyle 312. 14 . 9,

14:31 UTC.

14:38 1,247. , , , . (

POKE 0xFF, 9 Cabrillo David Dershon ) Bo

. . . Bo , , . ,

14:43 4,891. 12 POKE . ,  
. . Doyle ECHELON , , , , ,

14:47 11,340.

HVAC POKE . , , .

Doyle 30 .

. 32 backdoor . ( ,  
) backdoor .  
. INFO, PEEK, POKE — , , —  
backdoor .

14:52 UTC 17,200. 23.

("backdoor ") . 30

." Doyle ." .  
POKE Bo —  
30."

"?"

"Bo . . . .  
. . . ."

Doyle . 19,400. 19,800. 20,000. 2 .

," Doyle ." . , , ."

" . , , , NSA POKE  
."

."

. . . NSA  
— Bo POKE . . .

Doyle . . "Dr. Rana Bhatt . Greenbelt . . . .

, , . . ." Steve Foster

. Carla , Do

### 38: Max

.....

Max .

. Max , , .  
. . . .

5 47. . Hokkaido 4 — ,

. Max . 6 . Kali

GRU ( 300 Sakhalin) 3 .

, .

.

. . . Mission Street ,

. , . . . ,

, .

. , , . . . . Kali

. Zhengzhou Tokyo . , , .

Max . . . .

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Max . . Max , Tokyo Carla Glock

. " . . " : . . . .

, . .

, 2 . . . . ,

. 3 , , , . , IG-55,

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Max .

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. Kali — ,

. . . .

RF .

Steve Kali . Steve .

847 , . 60 .

. . .  
Max .  
1 . 3 , 3 200 .  
. Max : 3 HVAC, 3 , 3 , 1 HVAC, 1 , , ,  
, , , , .  
3 . .  
. . . 1 . 3  
. Kali 4 9 85 backdoor  
. .  
Max . . .  
— , , 3 ,  
. . .  
. . .

. . . .

. . .  
Max — , , .  
Max .  
. . Max .  
, . Vityaz-SN .  
. . .  
Max .  
1 ABC . 9. . . Max SFPD Maglite  
. . .  
3 . . Max  
. . . .  
. , Vityaz . Max —  
, . . .  
Max . , . .  
. . , ,  
. . .  
Vityaz-SN . . , , . . .  
Max . . .

. . . .

— , . Max

1 3 . . . ,

3 6 . .

— — . . ,

, . . . .

, Max .

IG-55.

Max 3 . — IG-55 , - ,

— .

. IG-55 21 14 . .

, , — , .

. . . . —

, , .

. Max .

3 . . .

, .

: Kali . . — , Max

. . . . , ,

.

4. Kali , — , , 85 . Steve

, , , .

," Max ." . . . "

Steve . " ?"

."

" 72. ."

Max Kali . . . . ,

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Bo Doyle .

, Hokkaido , Max

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Max . . . — , Max Abus Granit

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Max 1 — 3 . . . .

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Max 13 . IG-55 .

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. Max . , ,

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. Max , , .

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3 1 . 3 — Max

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( 30 ), HVAC , , IG-55 .

HVAC . . . . .

. , Max . . . . .

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Max . Kali . Steve

, SEAL .

. Max . ,

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David, Balboa Street . Foundation, .",  
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Max : " , , ."

David — , ,

. Asimov .

David : " , ."

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. Max — , , .  
. Max . . — .  
. , 1987 Valencia Street ,  
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. Max — . , ,  
Max . Max . .  
. . .  
Max . . . . Hokkaido ,  
, , POKE  
85 .  
. . Max .  
. David .

# 39:

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Kali .  
... 85 ,  
, , , .  
, Kali — Kali ,  
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Bo . , , 6  
POKE . .  
, FiO2 . Bo  
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Kali .  
POKE. POKE —  
, . Kali .  
, Steve ,  
. . — INFO, PEEK, POKE —  
(ISR) . .

. Kali .  
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— Bo —  
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. . . Kali  
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. POKE . . . .  
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3 . 940 3. ,  
David , , 3  
. . 940 3 . 3 Bo ,  
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" 12," Steve . " . 120 . 847 . "

Kali , Kali . 4 . , 72,  
EEG . . . 2 3  
, Charité — Kristin Bauer  
— .

" 12 ," Kali . , Steve , Iridium  
. "Rana . "

Rana 40 . Doyle , Steve .  
6 . 1,847 . Steve  
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"Rana , " Steve . "  
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Rana Bhatt .

. . . .

NSA Greenbelt , .

40 . . . , , USB  
. 6 UMBRA . . ,  
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1,320. 1,452. 1,847.

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. FDA .

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. 6 — MAUDE , ,  
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Rana . . . , Steve  
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Hokkaido, . " ?" , Steve

. Kali . .  
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Doyle .

OPS2A , NSA Kali . Bo , , ,  
. . Bo 14 6 ,  
. 40 .

" , " Kali . " — ,  
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Iridium Doyle : " . 30 . . "

. 70 NSA — NSA ,  
, . Kali . , ,  
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. Kali  
. 85 . — , , , ,  
— , 79 9 . 4 8 .

"Kali." Iridium Doyle , . " . . , , ,  
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" . . . " Kali . . .

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Doyle . " , . Bo. Sheng.  
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" , " Kali . " . 50 . "

Doyle , : " . "

Hokkaido .

Bo UTC 16:40 .

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. . Bo . . . 400

Kali . . . 400 ,

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" 31 38," Steve . " . 1,400 . ."  
" . . . " Steve . . 6  
. 12 847 .  
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. Veridian Medical Technologies 94,000 .  
. . Doyle Bethesda . Doyle .  
Steve Hokkaido ,  
. . 94,000  
1,847 .  
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"Kali." Doyle . "Bo . . .  
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". . ."  
. Bo POKE —  
Kali . . . .  
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Kali — , .  
Bei Dynamics . Sheng  
. Bo POKE .  
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Sheng . ,  
, , . Zhengzhou  
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. , , Sheng  
Bo .  
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Sheng . . .  
, Sheng .  
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" , " Kali . . " . , ,  
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92.

614 . . . . .

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— 149, 6,

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Kali 3. 68. mesh ,

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3 . Hokkaido . ,

. Waverley Street , ,

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. . San Jose State . . . ,

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Kali . Kali , .

David. 0xFF. . Asimov Lexus .

. Cabrillo Highway .

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Beach. Makarov PM, 9x18mm, . . . ,

, Palo Alto . Zhengzhou

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Max. 64, 32, 8, . . .

. . . Hokkaido

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Kali .

: . . . mesh . . . —

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A: Doyle . . . , ,

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B: . . . , , .

. Bo backdoor .

3.

Kali .

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mesh Max . 3 — 64,

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850,000 . firmware ,  
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NSA , Bo , . . ,

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David . . David CalTech , backdoor mesh  
 . David Kali , ,

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Max . . , Goodwill .

Max Kali . . . .

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Beach , . , , .

. Backdoor — . INFO, PEEK, POKE: , , .

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NSA . Bo . Sheng .

Kali . . 850,000 , ,

. NSA . Bo .

Sheng .

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. Holy Resurrection Cathedral. .

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 , . metacompiler  
 — , , . metacompiler

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 . , . 850,000

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C.

A( ) . B() . C: . Bell Labs ,  
, , metacompiler . Backdoor

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Metacompiler . backdoor , compiler —Steve  
— . Kali Zhengzhou

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. . Metacompiler . Steve , .

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Kali . . GRU — , ,  
Sakhalin . . . . .

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. (Zhengzhou , , )  
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Steve . .

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". . Metacompiler ."

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, 850,000

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Backdoor . Backdoor . . Backdoor . . . .  
Backdoor . .

Toolchain Alpha . Toolchain Beta . Steve . . . .

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. firmware —  
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" ?" Steve .

" . " . Zhengzhou ,  
. " . "

Kali .

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Steve . . diff. 4,000 .

"Backdoor," Kali . " . Backdoor . . ."

. Steve — , ,

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Metacompiler UTC 18:14 .

— metacompiler, , Kali

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metacompiler . . . . , ,

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Steve .

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" , " Kali . " . . . "

. GRU . Bo

— , , backdoor . . .

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Kali .

Max . 34.2 . . , mesh

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. . . , 1987 Valencia Street ,

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# 41:

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Waverley Street . Murphy Oil Soap .

Kali . — 60

( , ), 120 ,

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. Hokkaido ( , Steve , ). SFO(  
, , — Carla mesh ). SFO Palo Alto(  
Steve — Kali , Carla — Oregon , Bakersfield ,  
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. . "Kali." Kaliya, kanna, .  
, 8 , — , , Bangalore Palo  
Alto .

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. Murphy Oil Soap

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. PEEK POKE , ,

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, , compiler

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. . . — 1993 . Kali ,  
— — , 60

. Masala chai, Bangalore — , , , .

"David , " . , chai . " .  
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"." GRU . Devi . . " .  
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. Chai . .

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. Waverley Embarcadero , , ,  
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Kali . — , Tokyo  
. chai ,

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David Alta Mesa Memorial Park . Los Altos Hills. Waverley Street .

Steve . Kali .

. 1, . David Cabrillo Highway , Kali

Devi . Max Lexus

Shinjuku Kali : " . , , ."

. — , , , . Marie .

Marie. . Kali Waverley Street —

, Marie ,

. . . . , Kali — ,

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" , " Marie . " . , . ."

Kali .

Kali . — .

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Kali .

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Steve . . . — ,

. Los Altos Hills .

Kali . . Steve .

mesh , . . , , .

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— , David FDA

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— , , , Max

. . . . , , backdoor .

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" ?"

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, Carla Waverley Street .

"Beach ."

Kali . . . Steve .  
"PLA . . . SFO ." . Kali  
, FBI ." . Bo ."  
Kali . . 60 .  
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" ," Carla ." . "  
" ," Kali .

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, Kali — ,  
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— 88.7. .  
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. . , , Los Altos Hills  
— WiFi, Bluetooth, Hokkaido  
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. WiFi , .  
Steve , , .  
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— , idle cycles ,  
1 , , ,  
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, metacompiler ,  
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1986 3 14 Palo Alto Waverley Street , .  
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. . . , Nucleus 22 idle loop ,  
. mesh . 850,000 node .  
— WiFi, Bluetooth, , 60 ,

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Waverley Street . . 3 , , ,  
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Steve . . , , . . .  
. " ?" : , , . . ,  
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. idle cycles . . .

firmware , . . .

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firmware , FDA — Steve

CDRH , , ,

. , Kristin Bauer Charité . backdoor

, Wilhelm Hoffmann

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backdoor, NSA, Bo , Sheng .

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Mother . . . . .

. mesh , , Hokkaido

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David 1, .

1, . . . , . . .

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idle cycles . . . 88.7 . . .

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. , firmware , Mother metacompiler mesh  
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. Zhengzhou Frankfurt Bei Dynamics  
, ARM Cortex-A78 . — , ,

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. . . . , ,  
firmware , backdoor , backdoor .

Sheng . Wei Lin . Bei Dynamics , 2016  
. Kali Zhengzhou , metacompiler

Sheng . Bei Dynamics 3 4 .

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Mother .

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METACOMPILER — , ,

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1984, Unix C Ken Thompson "Reflections on Trusting Trust"("

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Thompson Unix , .

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. David A. Wheeler 2009 George Mason University . Wheeler

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— Michael Barr

Michael Barr Barr Group CTO . Michael 30 Fortune 100

. TV , ,  
20 .

2013, Michael Toyota —  
. 18 Toyota . Toyota

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Michael University of Maryland MBA . Programming  
Embedded Systems in C and C++ Embedded C Coding Standard . ,  
, 70 .

METACOMPILER . Michael Anthropic Claude AI

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, . : — AI,  
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METACOMPILER, [Amazon](#) . . . .