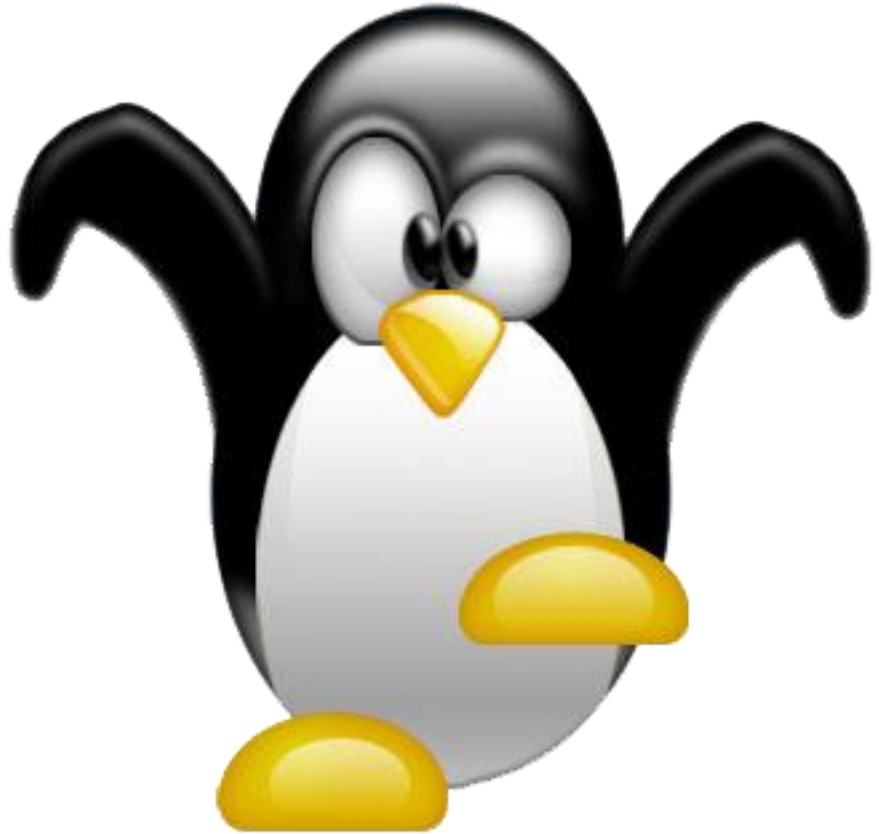


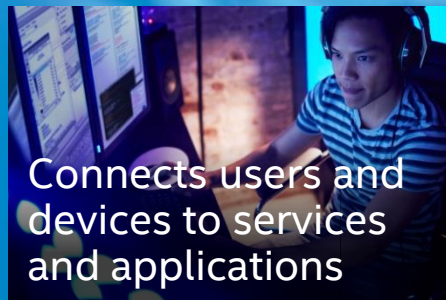


Linux and The network

Jesse Brandeburg



NETWORK INFRASTRUCTURE: YOU CAN'T SEE IT BUT YOU CAN'T LIVE WITHOUT IT



Connects users and
devices to services
and applications

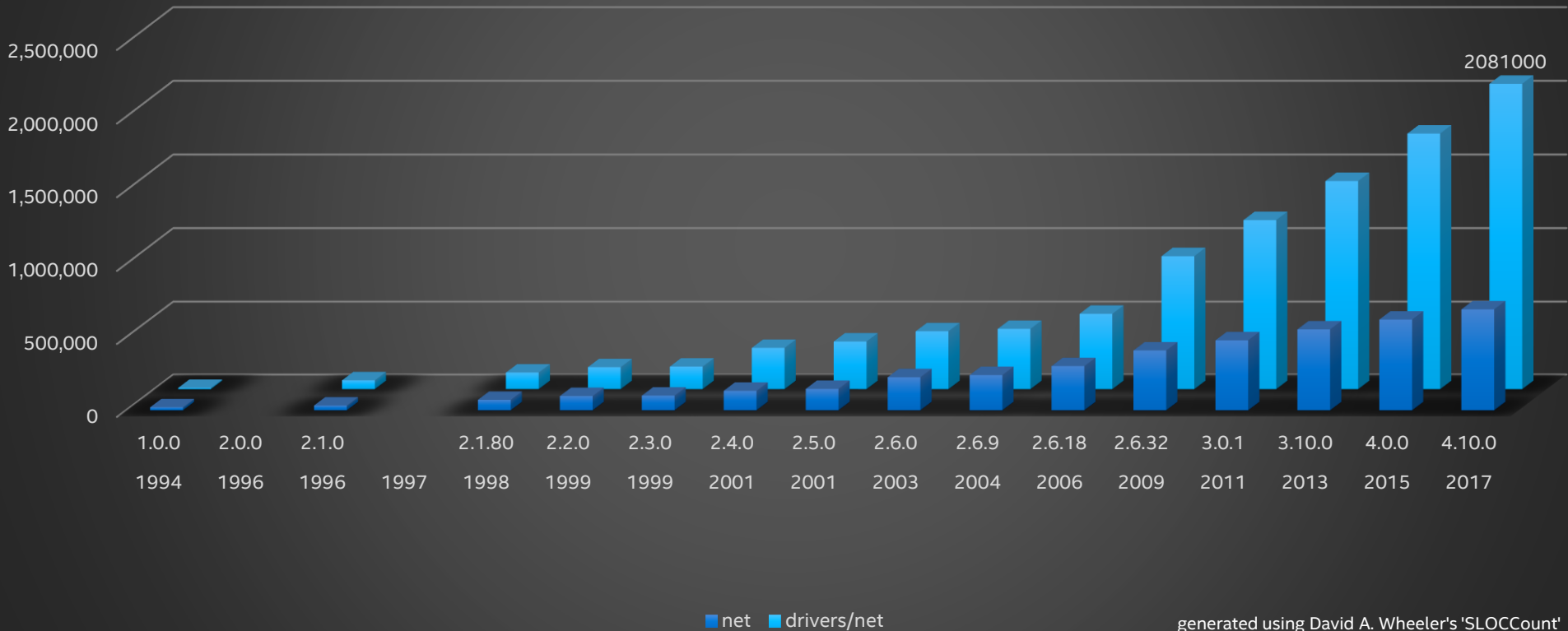


Links resources
within data center



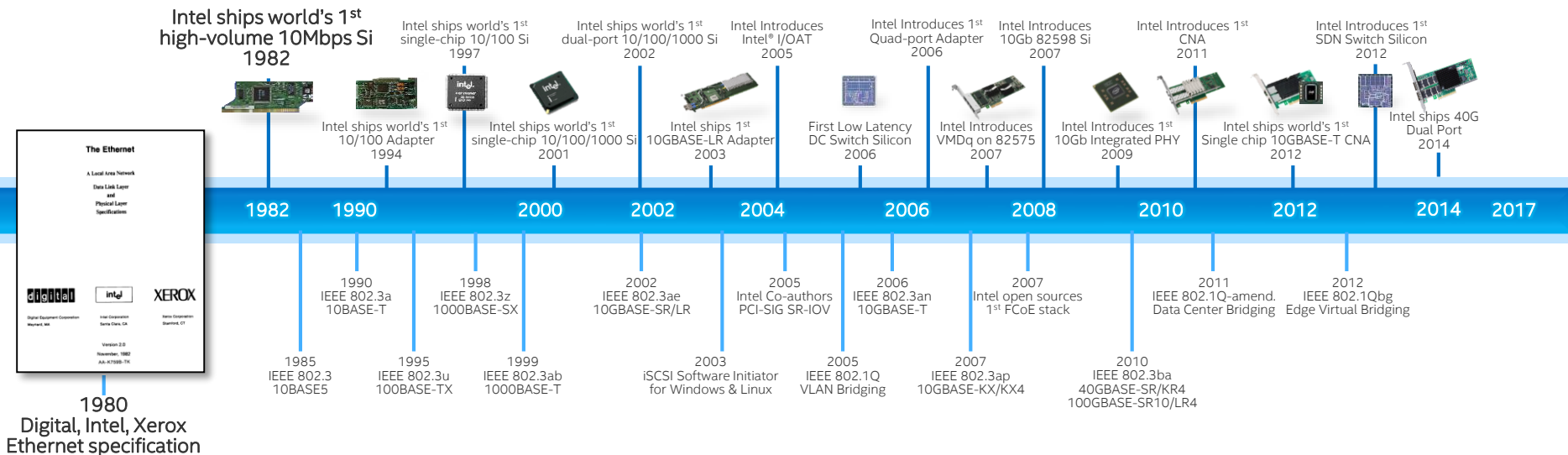
Connects
data centers

Networking Lines of Code by Release



Three Decades Evolving the Network

Intel® Ethernet Products



Intel has been with Ethernet from the beginning
Linux has included Intel NIC support from the beginning

Traffic is exploding

CAGR '11-'16
78%

1000x from
2010-2023

DATA TRAFFIC

Global mobile data traffic,
excl. Wi-Fi offload (Exabytes/year)



Source: Cisco 2012; Ovum 2012; ABI Research 2012; In-Stat 2012; , Analyst Reports; Lit Search; Bain Analysis

**EVERYTHING IS ON THE
NETWORK, AND THE NETWORK
RUNS ON LINUX**

Networking: From Device to Data Center



Wireless / Wireline Infrastructure



Small Cell



Macro
Base Station



Switch



Router



Core



Backbone

Data Center Network



**EVERYTHING IS ON THE
NETWORK, AND THE NETWORK
RUNS ON LINUX**



**50 BILLION
CONNECTED THINGS
ARE COMING**

THE NETWORK IS A CRITICAL ELEMENT OF THE NEW DATA ECONOMY

Connecting billions of devices will generate a massive wave of data

Autonomous Driving

1 GB/second

Smart Hospital

4000 GB/day

Connected Factory

1 million GB/day




**EVERYTHING IS ON THE
NETWORK, AND THE NETWORK
RUNS ON LINUX**



The Internet of Things delivers insights but new radio and network capabilities are needed for

SCALE AND SCOPE

A man wearing a VR headset and holding a controller, standing against a background of space with Earth and the Moon. The man is wearing a blue t-shirt and a plaid shirt. He is holding a VR controller in his right hand. The background shows the Earth and the Moon in space, with some white lines connecting the man's head and hand to the text.

The cloud will alter how
we perceive reality but immersive
experiences will require

MORE BANDWIDTH





Autonomous vehicles are
almost here but ultra
reliability requires

ULTRA LOW LATENCY





All these things need
End to End

SECURITY





All these things need
End to End

Crypto Hardware
Offload is no longer
a choice

SECURITY





All these things need
End to End

SECURITY

Crypto Hardware
Offload is no longer
a threat

Required

Some assembly may be required...

The data gets transported into the cloud

There is going to be much more than can be comprehended

Artificial Intelligence is the only way to make sense of it all

Network is the path to the storage, the guarantee of integrity of communications to enable the AI

The AI is dependent upon the network.

PUTTING IT ALL TOGETHER: AUTONOMOUS DRIVING

Cloud



Powerful analytics required to make sense of massive data from moving vehicles

Core Network



Network will isolate vehicle data in a 'container', separating it from other types of data

Access Network



Cloud computing at the mobile edge lowering latency

Wireless Technology



5G radios integrate 'vehicle to vehicle' and 'vehicle to everything' connectivity

Smart Devices



Vehicles will have intelligence to manage internal systems and connect to cloud

**EVERYTHING IS ON THE
NETWORK, AND THE NETWORK
RUNS ON LINUX**

WHAT'S IN STORE

Intel-next

Switchdev is the New Black

Intel is moving products to Switchdev

Actively developing

More contributions are coming

Current patches for i40e enable port-representors with slow path

Intel Networking Future

The speed march continues, 100, 200, 400 Gigabit Ethernet

New driver coming to upstream for review “soon”

Hardware filters via tc

Devlink configuration

Need to figure out what a complete switchdev ecosystem looks like

Continued close collaboration with the community

Lots more that we can't talk about yet...

BENEFITS OF STRONG ECOSYSTEMS



**Spark More
Innovation**



**Reduce
Development
Effort**



**Advance
Open Standards**



**Increase
Interoperability**



**Reduce
Time to Market**

**EVERYTHING IS ON THE
NETWORK, AND THE NETWORK
RUNS ON LINUX**

