# ConnectGuard™ Security

## Intelligent. Fast. Secure.

Dr. Michael Ritter

October 12th, 2016

# Organized Crime Turning to Cyberspace

- No longer dominated by hackers accessing computer systems just for fun

- Criminal-to-Criminal models to create crimeware tools

- Crime-as-a-Service business models

- Financial gain ranges from tens of thousands to tens of millions of dollars

Transforming into a global, fast-expanding and profit-driven industry

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# High-Tech Attacks, High Cost

- Average incident costs a company 3.8 million US dollars

- Reputation and the loss of customer loyalty does the most damage

- Healthcare, education and financial sector incur highest costs



Legend:
- Malicious or criminal attack — 47%
- System glitch — 28%
- Human error — 25%
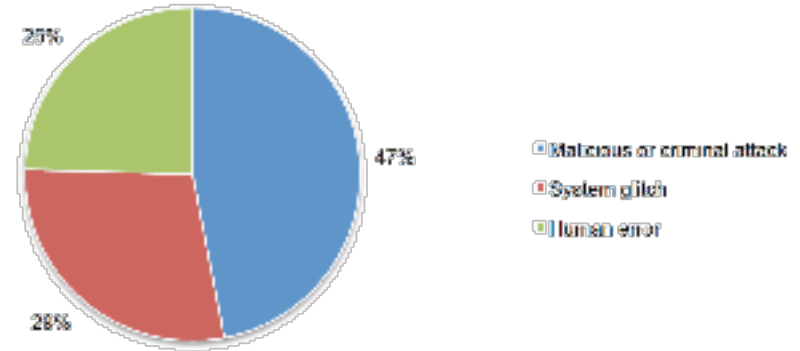
Ponemon Group: 2015 Cost of a Data Breach Study: Global Analysis

It's just easier to say, if it goes out of our premise, it's encrypted

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# Data Protection Obligations are Evolving

- Law makers and regulators are increasingly engaged in implementing new legal frameworks

- Focus on encryption has been prominent within recent legal developments

- Financial, personal health, private individual, military, government and sensitive business data

Establishing data privacy compliance has become a major challenge

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# The Cloud Security Problem

- Clouds change constantly

- Cloud traffic traverses hypervisors

- Enterprises are in a transitional phase

- Regulations and standards are almost all pre-cloud

Security at the speed of cloud is scary – and necessary

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# NFV – New Challenges to Security

- Reliance on additional software

- Reduced isolation of network functions

- Fate-sharing due to resource pooling and multi-tenancy

- Dynamic allocation of virtual resources



Technological innovation drives evolution in the threat landscape

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# Ways to Secure Private Data



Physical Security

Data Encryption

Logical Security

Encryption is part of a toolkit for a tiered data security strategy

# Options for Data Loss Prevention
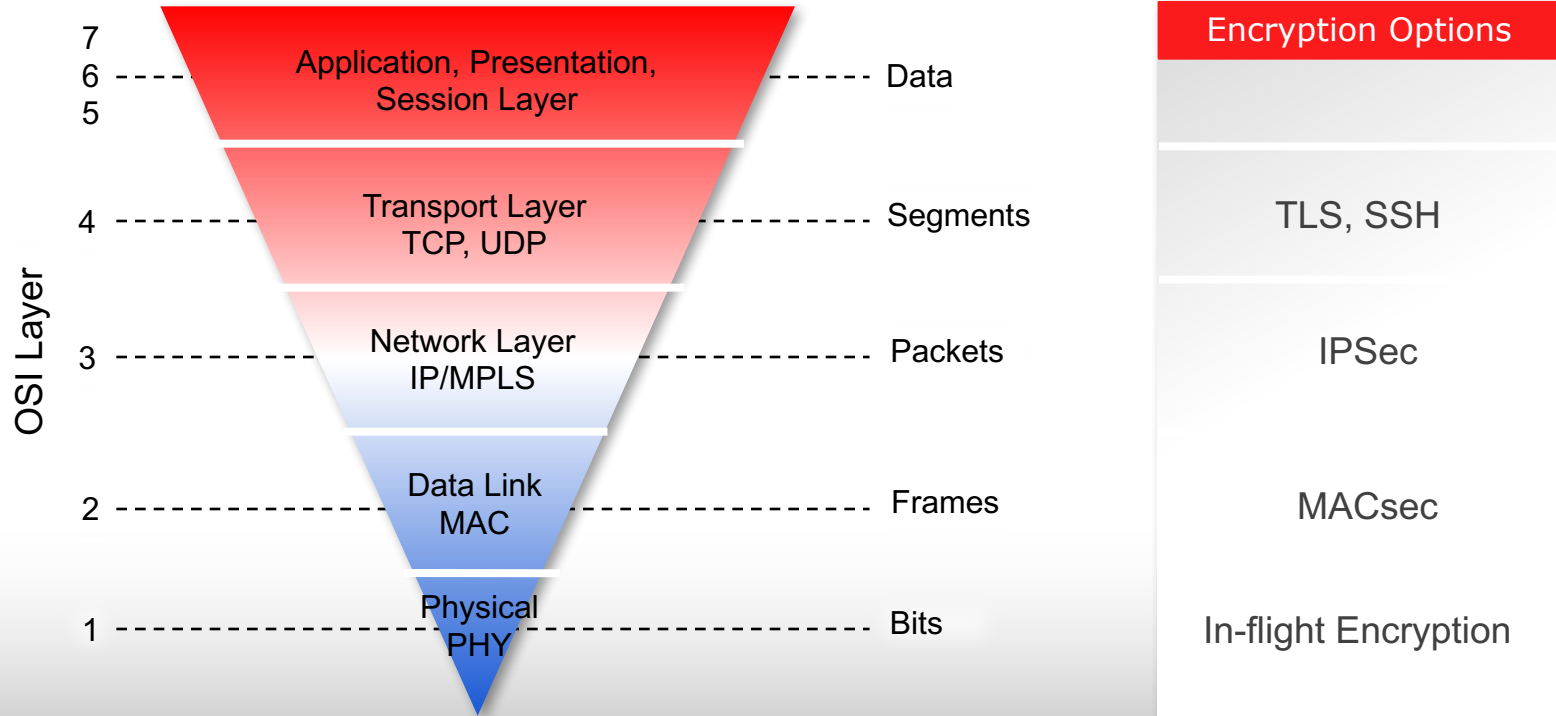
## Encrypting Data at Rest

- Proactive

- Pushed to data owners who become policing cloud

- Keys must exist as long as data

## Encrypting Data in Motion

- Preventative

- Centralized administration preventing accidental disclosure

- Session keys only

Both are essential components of a modern security environment

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# Securing Data in Motion



OSI Layer

7
6 — — — — — — — Application, Presentation, Session Layer — — — — Data
5

4 — — — — — — — Transport Layer TCP, UDP — — — — Segments

3 — — — — — — — Network Layer IP/MPLS — — — — Packets

2 — — — — — — — Data Link MAC — — — — Frames

1 — — — — — — — Physical PHY — — — — Bits

## Encryption Options

TLS, SSH

IPSec

MACsec

In-flight Encryption

# IPsec Challenges – Technical Aspects

## Latency
- Delay is measured in msec instead of µsec

## Efficiency
- Up to 50% additional bandwidth overhead

## Scalability
- No wire-speed performance up to 100Gbps

## Speed
- Slower connection establishment

## Compatibility
- Only works for IP traffic

## Complexity
- Issues scale linearly with links and endpoints

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# Tapping Fiber-Optic Cables is Reality



UK Government Communications Headquarter
– GCHQ –

… GCHQ was able to boast a larger collection of data than the US, tapping in to 200 fiber-optic cables to give it the ability to monitor up to 600 million communications every day …

… the GCHQ operation codenamed "Tempora" has been running for 18 months …

… information from Internet and phone use was stored for up to 30 days to be sifted and analyzed …

# Spying Together for Success



… commercial consortium personnel had apparently discovered the program "Wharpdrive", for which SSO had tapped a fiber-optic cable …
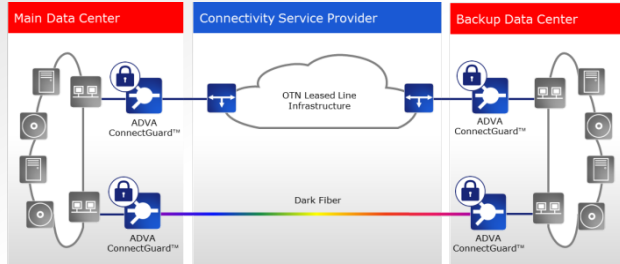
… all signs indicate that the agency had help from Germany's Bundesnachrichtendienst (BND), …

… it isn't clear from the document exactly where the BND and NSA accessed the fiber-optic cable nor is there any indication of the operation's target …
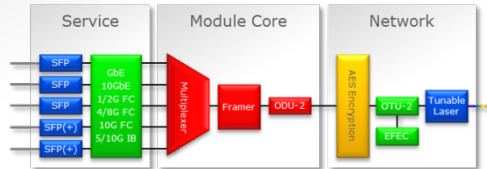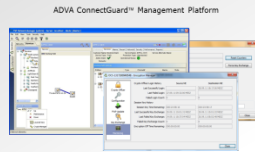
# Secure Data Center Interconnection

### Application



### Benefits

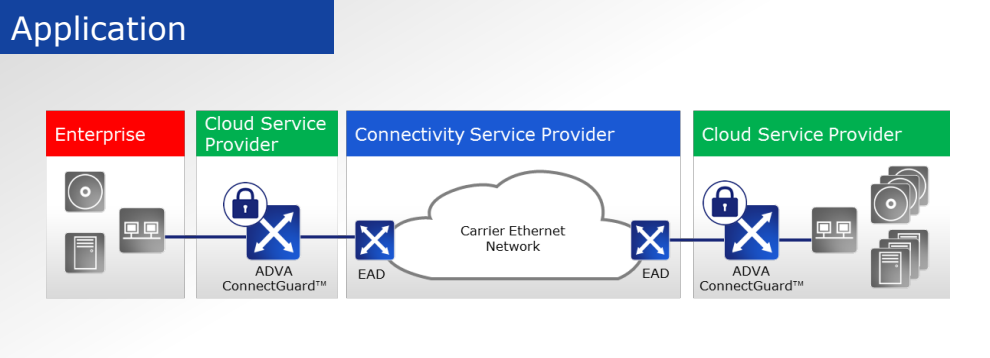- Highest performance
- Lowest Latency
- Maximum security



### Technology



### Solution

FSP 3000



Innovation for high-performance cloud data center interconnect

# Secure Access in Virtual Networks

## Application

| Enterprise | Cloud Service Provider | Connectivity Service Provider | Cloud Service Provider |
|---|---|---|---|

Carrier Ethernet Network

ADVA ConnectGuard™

EAD

EAD

ADVA ConnectGuard™

## Benefits

- Highest flexibility
- Minimum overhead
- Maximum security

Connect Guard™

## Technology

ADVA ConnectGuard™ Management Platform

Enhanced MACsec Implementation

Encrypted

| DA | SA | S-TAG | SecTAG | C-TAG | EType | Payload | ICV | FCS |
|---|---|---|---|---|---|---|---|---|

Encrypted

| DA | SA | S-TAG | C-TAG | SecTAG | EType | Payload | ICV | FCS |
|---|---|---|---|---|---|---|---|---|

## Solution

FSP 150

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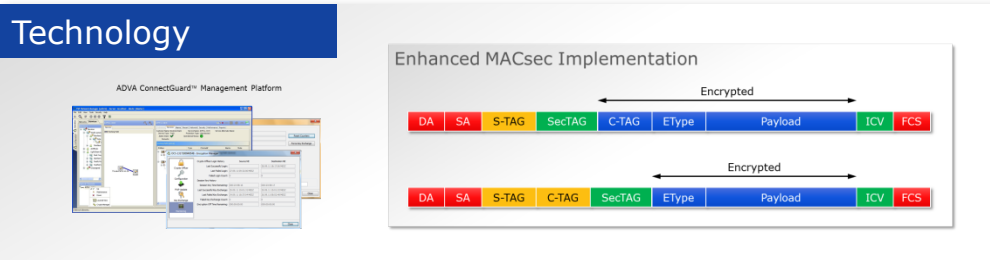
Innovation for flexible cloud access in fixed and mobile applications

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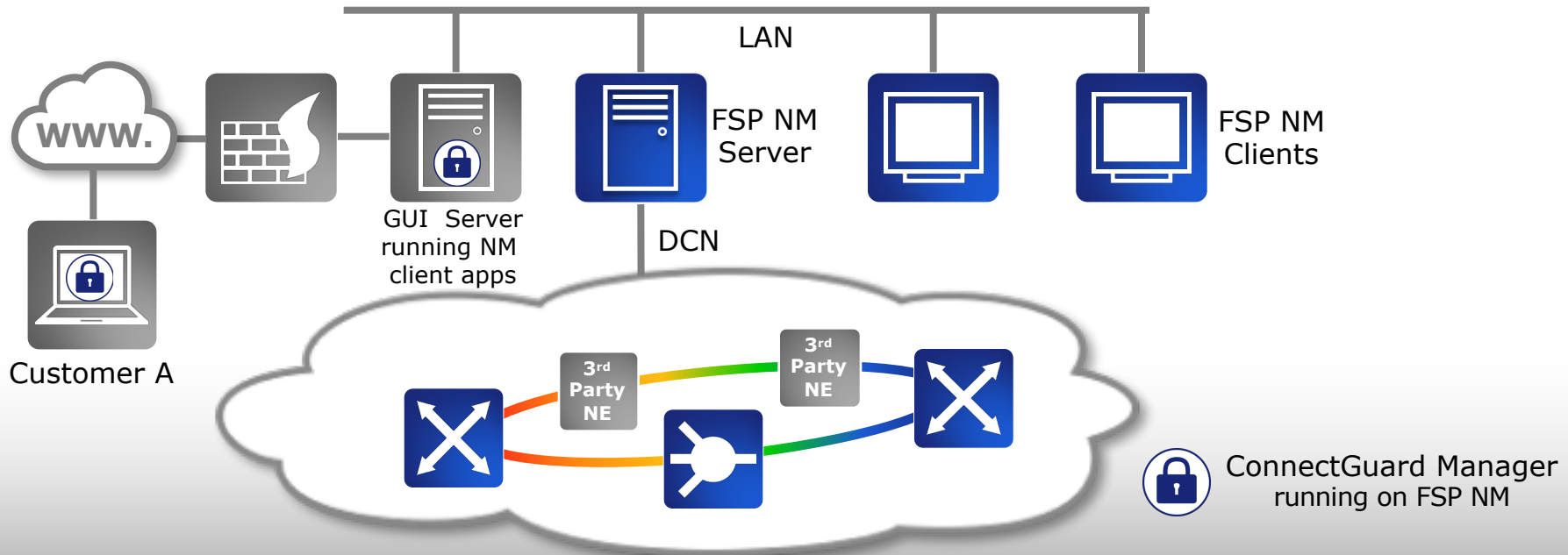
# Making Connectivity Networks Secure
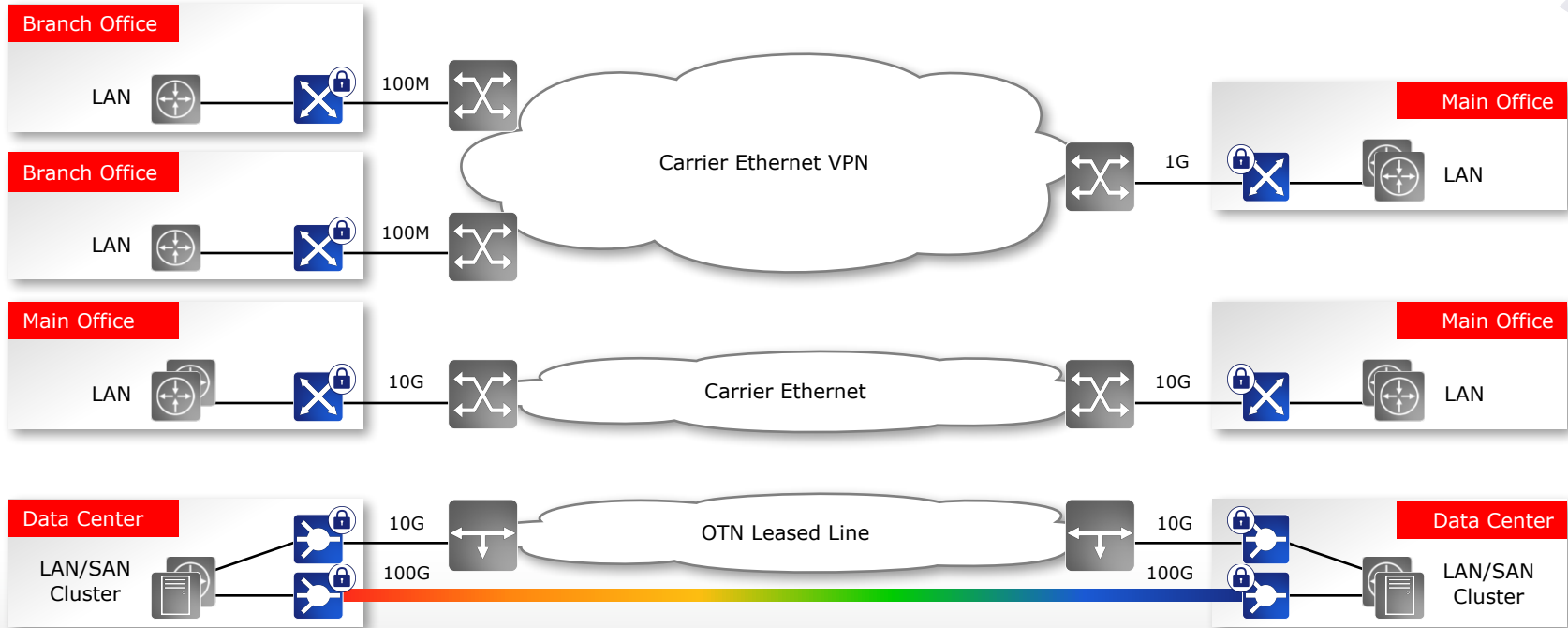


High throughput, low latency and cost-effective trust model

# ConnectGuard™ Management



Encryption domain management by managed service subscriber

LAN

GUI  Server
running NM
client apps

FSP NM
Server

FSP NM
Clients

DCN

Customer A

3rd
Party
NE

3rd
Party
NE

ConnectGuard Manager
running on FSP NM

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# ADVA ConnectGuard™

- Intelligent! – Efficient integration with transport technology

- Fast! – Scales up to 100Gbit/s

- Secure! – Industry-compliant



Security Management
FSP 150
Key Management
AES-256
Tamper Protection
Ethernet
Diffie-Hellmann
Approval
FSP 3000
Connect Guard™
Certification
Encryption
Random Numbers
Optical
Vulnerability Management

**Differentiation by high-performance protection of data in motion**

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# Adopters of Optical Layer Encryption

**Banking**

**Government**

**Health Sector**

**Commercial**

**Connectivity Service Provider**

ADVA ConnectGuard™ – first choice for businesses around the world

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# Securing Our Family Relationship



"My emotions are encrypted to protect the security of our marriage."

# Thank You

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