

SDN/NFV DDoS Requirements "The Mobile Use Case – 5G"

Bipin Mistry, VP Product Management

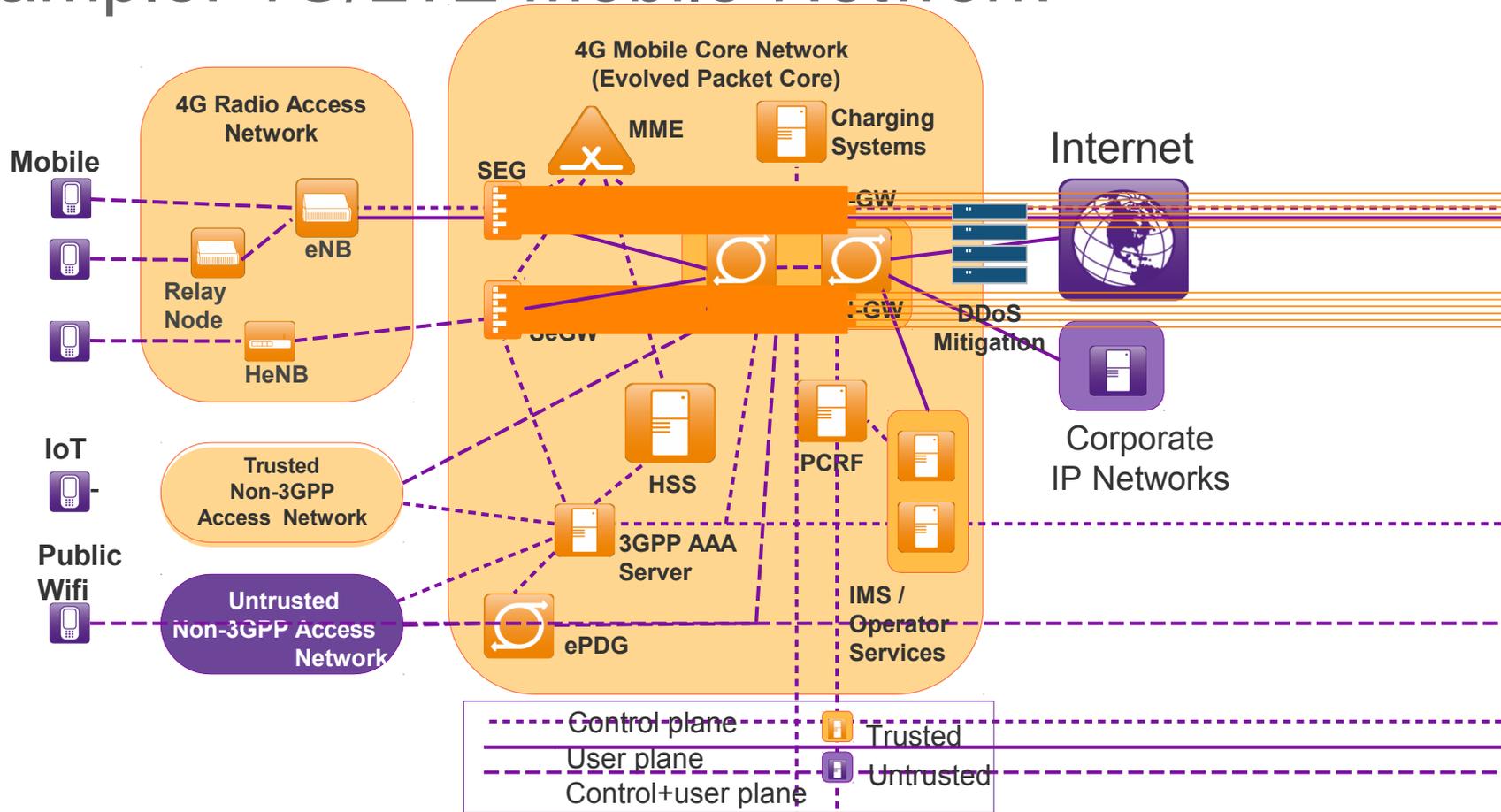




The Shift from Transport Centric to Service Centric Architectures

- Yesterday's SP Network –
 - Access
 - Access Edge,
 - Pre-Agg,
 - Aggregation,
 - Transport Core,
 - Centralized
 - Services/services complex
 - Not open
 - Security - maybe as an overlay, some level of encryption
 - DDoS – either RTBH, scrubbed or passed on downstream

Example: 4G/LTE Mobile Network





Threat mitigation

- 3GPP addresses security of interfaces mainly
 - Security specified for radio interface, backhaul link, core interfaces
 - protects **traffic** against **interception**, **modification**, **replay**
 - Subscriber authentication
 - protects against **theft of service**, **impersonation** of other subscribers, **fraud**
 - There's a new trend in 3GPP to cover also **platform security** – by
 - standardizing **requirements** (solutions are proprietary)
 - This leaves a lot to address otherwise:
 - Flooding, crashing or compromising nodes by exploiting implementation flaws,
 - compromising network elements via weak O&M procedures, ...
 - IP network security, network element security
 - Out of scope here: physical site protection, organizational security measures (e.g. malicious insider threat)

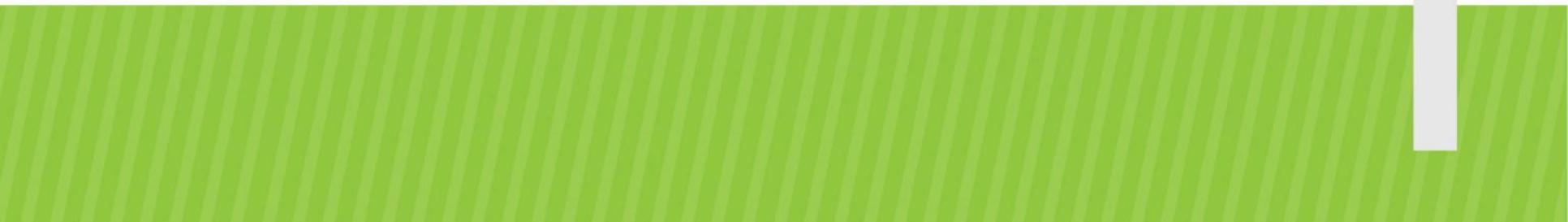


The Shift from Transport Centric to Service Centric Architectures

- Tomorrow's SP Network Architecture:
 - Service/subscriber centric
 - Virtualized
 - At the Network and Application level
 - Programmable
 - Server Centric
 - Not appliance centric
 - White box solutions
 - Elastic
 - Intelligent – Analytics driven
 - Service Velocity
 - Has to be SECURE!!!! – What type of security ?



5G – as an example



The “5G Vision”

Smart network convergence

An open ecosystem for innovation

New network and service capabilities

Business models based on shared resources

Better sustainability and scalability

Technology Enablers

Software Defined Networks (SDN)

Mobile Edge Computing (MEC)

Network Function Virtualization (NFV)

Big Data and Machine Learning

100110010011

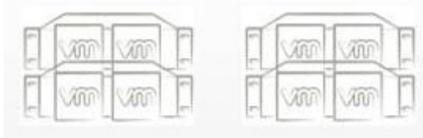
The Big Picture: Software-Defined Mobility

Cloud Radio Access Networks

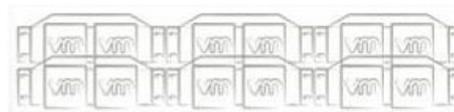


Base station workloads shift onto virtualized compute (Macro/Small Cell)

Network Function Virtualization



vEPC, vePDG Gi/SGi-LAN
Programmable infrastructure for separation of Control/Forwarding Plane, granular control of service paths through virtual functions



Orchestrators/Big Data infrastructure through abstraction layers Apps

Mobile Edge Computing



Highly distributed computing environment that can be used to deploy applications and services in close proximity to mobile users



Service support functions and applications shift to open standards



Software Defined Networking

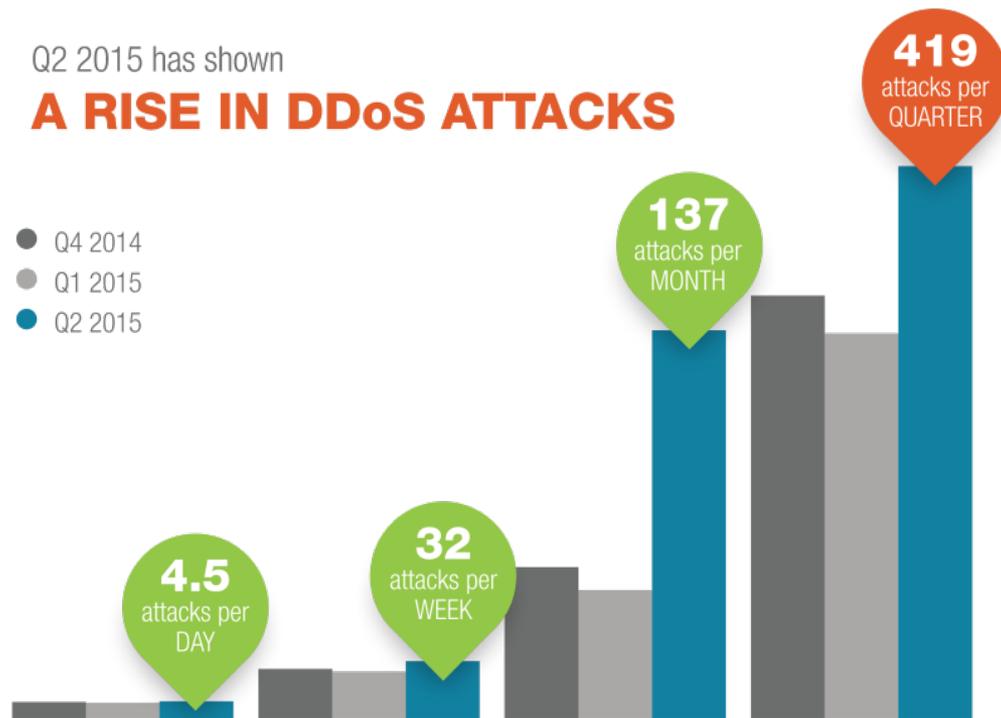


Security – Specifically DDoS



The Problem is Real – and Pervasive

- Our average customer sees almost 4.5 attacks per day!
- Some customers see many more
- Across all verticals and segments
- No one is immune!



The “5G Vision”

The 5G Infrastructure Public-Private Partnership





Thank You

