Global vision.
Local knowledge.

Cisco Connect 2019
Serbia, 19th March 2019
Cisco Connect 2019 Service Provider
Next Generation Cable Access Architectures
Transforming Cable Infrastructure Owners to Services Owners

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Agenda

Your Cable Access journey

- The new normal: Digitization is changing everything
- What this means for your business
- What your business could look like tomorrow
- An introduction to Cable Access Services
- Others ‘know’ the network. We built it.
- The Cisco Difference
Cable Fast Facts

Global IP Traffic
is expected to triple from 2015 to 2020

IP Video Traffic
will account for 82 percent of traffic by 2020, up from 70 percent today

Virtual Reality
traffic will increase 61-fold between 2015 and 2020

Wearables
will increase 5x by 2020, up from today’s 97 million devices that are generating 15 petabytes per month

UHD TV (4K TV)
will be 20.7% of IP VoD traffic in 2020, up from 1.6% today

Look back at 2016

Sneak peak into 2020

72.5 EB/Month

17.9 PB/Month

194 EB/Month

1 EB/Month
The new normal: Digitization is changing everything
Digitization is disrupting every business model

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Are your cable access networks ready?

- Silo-based and unmanageable
- Multiple overlay networks
- Extensive power and cooling expenses
- Difficult to scale up

Your challenge

- Meet the growing demands of customers
- Take on over-the-top and cloud-based competition
What We’re Hearing from Service Providers

Speed, Flexibility, and Profitability

I WANT:
Simplicity for implementation and operations allowing a faster time to market

I WANT:
Flexibility for workload placement, elastic capacity, and network slicing

I WANT:
The speed and agility to offer on-demand services

I WANT:
To improve profits by reducing OpEx with operational efficiencies

I WANT:
To increase profits through new services and CapEx reduction
Redefining The Cable Network
Digitalize, Virtualize, and Automate

Digitalize the access network with Remote PHY and a robust IP network

Ensure interoperability, standards based, open protocols, ready to leverage automation

Benefits: Lower operating costs and deploy new services faster
Transform the Cable Headend
Cisco Remote PHY Portfolio

Evolve to Remote PHY CCAP with the Cisco cBR-8
Cisco Remote PHY Portfolio

- **cBR-8 RPHY Core**
  - iCCAP or RPHY Core
  - Enablement with D-PIC

- **Remote PHY 7200 Shipping**
  - Medium to large hubsite
  - 7RU 72SG
  - 12+1 HA

- **Remote PHY 300/600 Shipping**
  - Small hubsite
  - Compact design
  - 1RU 3/6 SG

- **GS7000 iNODE w/ Remote PHY 120**
  - High-output, fiber deep node
  - Intelligent Node
  - 1x2 RPD

- **GS7000 BAU w/ Remote PHY 220**
  - Standard output, BAU node
  - 2x2 RPD

- **FDX Capable iNODE w/ Remote PHY 120**
  - FDX Capable Node
  - Will operate in Legacy or FDX Mode (future)
Use Case 1 - RPHY Shelf

Consolidation to leverage CMTS Capacity

- Provides hub site consolidation
- Increased scaling and density
- Lower power consumption and smaller footprint
- Increase in supported segments on the CMTS (2x/4x)
- Enables DOCSIS 3.1 for rural regions
- Linear fiber from headend for better MER and D3.1 modulation profiles
- Enables transition to Cloud Native CMTS
Consolidation to leverage CMTS Capacity
- Enables Ethernet to the node which increase plant value
- Increased core scaling, enables hub site consolidation
- Lower hub power consumption
- Lower optics costs (10G)
- Higher bit-rate for D3.1 modulation profiles
- Enables transition to Cloud Native CMTS
The Cisco Remote PHY Solution

- Open Standards compliant, the only standard in town…
- First company to submit R-PHY Code for the OpenRPD Project
- Only company to be at **EVERY CableLabs InterOp** with both a core and RPD
- First company to bring multiple Remote PHY Devices (RPDs) to market
  - GS-7000 1x2 and 2x2 BAU RPD
  - RPD Shelf in compact and full HA modular form factors
- Minimal Core Changes
  - Change the RF PIC to a DPIC on the cBR8
  - Instantly doubles the number of Service Groups to 16 per LC
  - Virtual Splitting and Combining capabilities
Interoperability - Core and RPD
Cloud Native Broadband Router cnBR
Transforming Cable Infrastructure Owners to Services Owners
Transform the Cable Headend

Evolve to cloud native CCAP with the Cisco Cloud Native Broadband Router
Evolving the DOCSIS Network

TODAY

Infinite Broadband
Full Duplex DOCSIS

Converged Access
Cisco Container Platform,
CCAP VNFs,
Mobile Backhaul over DOCSIS

Cloud Native, Intelligent HFC
CMTS, eQAM, iNode, Advanced Automation System Orchestration

Remote PHY
HFC Digital
CCAP Core, Smart PHY RPD automation, Digital line cards, CIN

CCAP
HFC Classic
DOCSIS 3.1, Converged Video, Deep Fiber

2017

2020

SOFTWARE Driven FLEXIBILITY

CAPACITY IMPROVEMENTS

SIMPLIFY & TRANSFORM

AGILE, FLEXIBLE, PROFITABLE

NEW USE CASES

THE PROMISE LAND

10Gbps

1Gbps

TIME
Enables Convergence At The Edge

End2End Automation Integration

AppliccnBRStack

Cloud Native Stack

AppMobilityack

Cloud Native Stack

Other web apps

Cloud Native Stack

Kubernetes Cluster

Host OS

Server HW

Compute

Host OS

Server HW

Storage

Host OS

Server HW

Network
The Cisco Cloud Native Broadband Router is...

- Not a lift and shift of legacy, monolithic software
- Not tied to proprietary hardware
- Is open standards based, modular, elastic, composable, and resilient
Why Cloud Native?

**Definition**
An application designed for the cloud consisting of multiple microservices, that are elastic, resilient, and composable.

**Benefits**
- Service velocity
- Streamlined Operations (DevOps)
- Non-Stop Service
  - Inherently Resilient and Elastic Scaling
  - In-production validation early and often
- Modular and composable microservices
- Built on open standards
**Why Cloud Native versus Virtual Machine**

### Cloud Native Benefits

**Scale Capacity**
Operators need the ability to quickly scale network resources and meet the increasing demands for connectivity and bandwidth.

**Demand for New Services**
New market opportunities like the Internet of Things (IoT) and mobility are fueling the need for operators to evolve.

**Need for Lower Cost**
The need to continue to lower the cost per bit through efficiency, automation, less power, less physical space requirements.

**Need for Resiliency**
Networks are always on and operators are challenged with monitoring, maintaining, and remediating faults, ensuring service availability and reliability for their end users.
Transformational

Cloud Native Broadband Router

<table>
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<th>DOCSIS APP Services</th>
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High Performance Container Networking

Cloud Native Infrastructure: Kubernetes, Docker, etc

Host OS

Server HW / FW

New Services and/or subscribers
Using Same Building Blocks

- Versatile & Scalable from small to large
- Easily plugs into existing networks
- Uses consistent building blocks throughout
  - Same cnBR software
  - Stackable servers / routers / switches
  - Versatile R-PHY Shelf and R-PHY node products

All hardware available today!
**cnBR: Entry Level System, No Redundancy**

Applications: lab systems, small customer trials, small deployments

- **UCS C220 M5 Rack Server**
- **1 Switch**
  - NCS5501-SE (4x40/100G+40x10G)
- **Optional hardware - RPDs, nodes**
  - RPD Nodes: GS7000 iNode, GS7000 SHO
  - RPD shelves; Smart PHY 600
- **Software**
  - cnBR including cnBR dashboards
  - Kubernetes and other 3rd party licenses (via Cisco CCP)
  - SmartPhy for configuring RPDs and iNodes
  - IBU licensing including special rate for lab use and small pilot field trial
cnBR: Entry Level System, High Availability
Applications: First limited scale deployments with HA

- The 2xUCS MVP offering is initially deployed in the Headend of a small operator
- The initial cnBR POD is scaled to support 8,000 subscribers
  - (4,000 subs per UCS)
- The two NCS-55A1-24H chassis are using 8 of the (24) 100G ports that are available on the Spine
- Two 40 port leaf switches support 80 RPD’s and 100x10 Mb subs per RPD
  - (1 Gb/port)
cnBR: Entry Level System, High Availability
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- Two 40 port leaf switches support 80 RPD’s and 100x10 Mb subs per RPD (1 Gb/port)
- Additional RPD’s could be supported by adding Servers and Leaf switches above and below the Spine
- The cnBR POD supports 32,000 subscribers at full scale
- The bandwidth per POD increases from 80 Gb to 320 Gb at full scale (8+1 UCS servers)
- The power on the cnBR POD increases from 4.3 kW to 10.6 kW at full scale
Cloud Native Broadband Router | Automation & Analytics

**Purpose**

Designed for automation and streamlining operations to manage complexity and unlock feature-service velocity.

**Benefits**

- Designed to be simple and easy to automate
- Open source tools and development
- Leverage the agility that web/OTT has benefited from
- Provision and scale new services efficiently
Comprehensive Portfolio For Transformation

**End to End HARDWARE**

**Top to Bottom SOFTWARE**

Transform your entire network with Cisco

**Automation**
- Crosswork Network Automation
- Smart PHY

**Multicloud**
- Cisco Container Platform
- CloudCenter
- UCS, HX

**IP Edge**
- NCS Series
- ASR 9000 Series

**CCAP**
- Cloud Native Broadband Router NEW
cBR-8

**IP Aggregation**
- NCS 5500 Series
- NCS 500 Series

**Digital Access**
- Remote PHY for Nodes
- Remote PHY Shelves

**Hybrid Fiber Coax (HFC)**
- GS7000i SmartNodes
cnBR Deploy - Simple, Fast, Consistent Experience

Simple - One-button deployment and lifecycle management
Fast - New cnBR service, from clean K8s cluster to CMs online, in <15 mins
Deployment Monitoring
Consistent Health and Status

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Service Status - Simple and real-time

SG Health

CM Troubleshooting
Unprecedented Insight Into Operations

- Streaming vast array of telemetry data
- Data visualization with modern tools
- Actor-based, easily customizable Dashboards
- Ability to rapidly pinpoint problem areas
Popunite anketu, preuzmite poklon na pultu „Informacije” i učestvujte u izvlačenju nagrada na zatvaranju konferencije
Sponzori

Platinum sponzor:

MDS

Zlatni sponzori:

Asseco  Comtrade Distribution  Comulbi  Inram  SAGA

Srebrni sponzori:

Algotech  Amber Software  Comtrade System Integration  COMAT  Epson

Learning partner:

Fast Lane