

Requirements for mission critical multi service networks in transit systems.

Tom Ceunen

*OTN Systems, Sales Director US
Herndon, VA*



2011 Rail Conference

Who is OTN Systems?

- OTN Systems develops and supplies fiber optic communication networks for Metros, Light Rail, Railways and Maglev.
- More than 15 years of experience at 85 Transit Authorities world-wide: Amtrak, SEPTA, Sprinter, ...
- Member of APTA & UITP

Intro: What is important for you?

Passengers

Safety

Security

Comfort

Price

New services

Operators

Operational safety
Cyber security

CCTV
Access control
.....

Public announcements
Smart ticketing
Clear Message Signs
...

Low cost of ownership
Open to sub suppliers
Maximum flexibility

Future proof

Network

High reliability
Deterministic behavior
Unhackable

Video solution
Easy integration

Redundant network
24/7 service
Simple installation
Open system

Limited training
Zero maintenance
No upgrading required
No downtime
Open system

Open interfaces
Innovative solutions

Multi

Simple

Non Stop



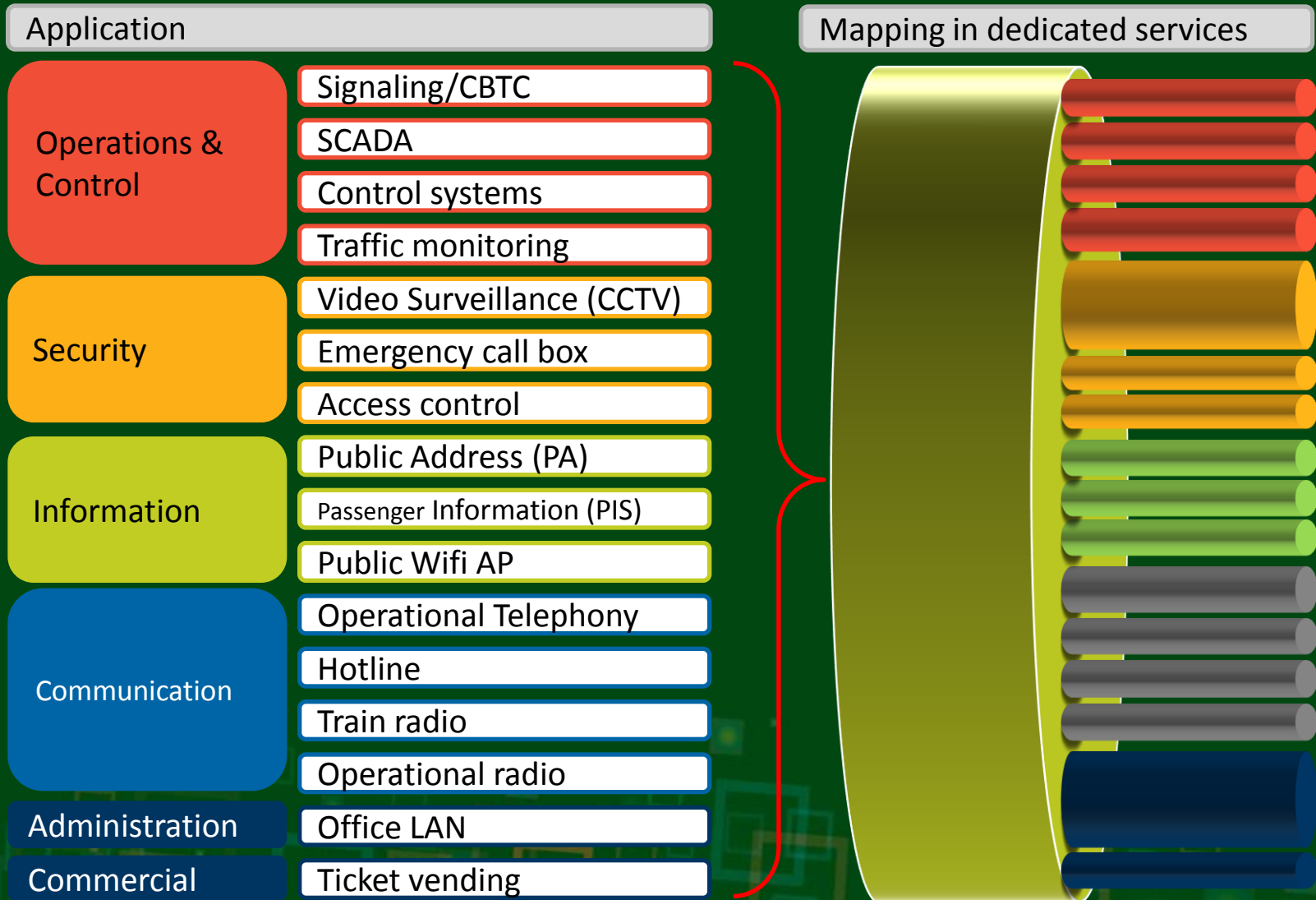
Cost Effective

Multi: Connect all applications

- Many different applications
- Integration must be easy
- Applications may not interfere
- Network has to provide enough capacity
- Network has to be future proof but also support legacy interfaces



Multi: Mapping of applications into services on the network



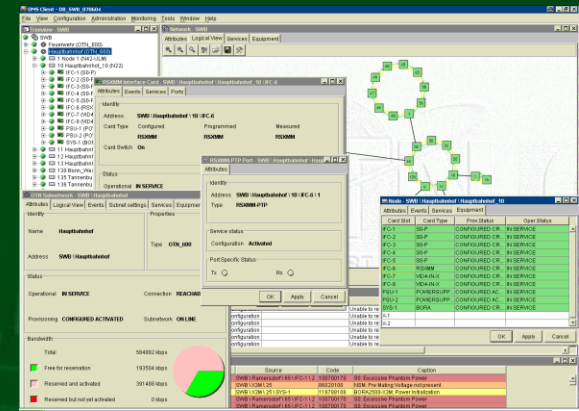
Keep it Simple!

Why?

- Easy network design & planning
- Project risk reduction
- Limited training costs & knowledge obsolescence
- Reduction of human error
- Speed-up trouble shooting

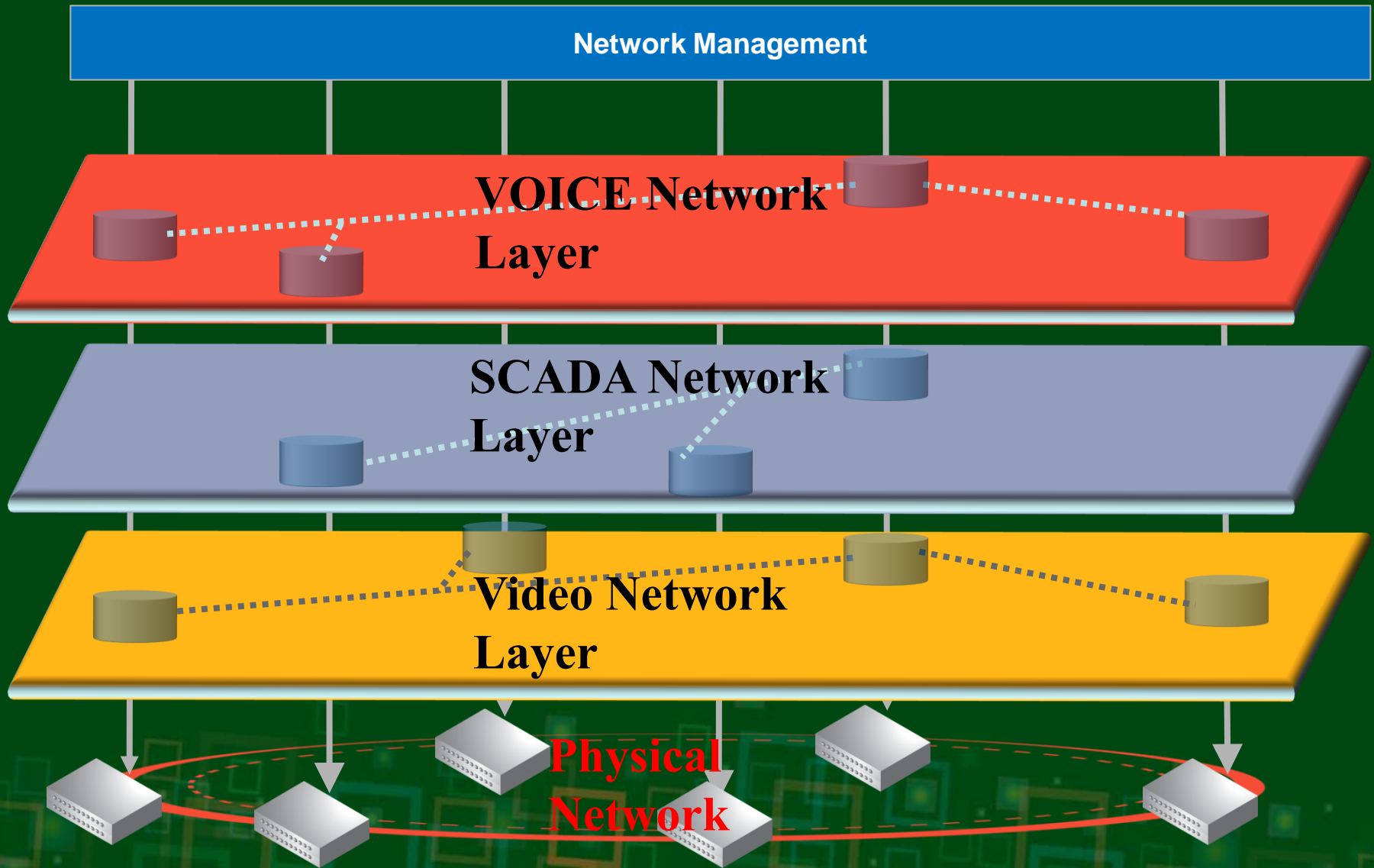
Keep it Simple! How?

- Use hot-swap modular hardware
- Use a system-wide graphical network management system
- Separate the network into smaller, easy to manage application sub-networks



Keep it Simple!

Split into application sub networks



Non-stop

- Network downtime has to be avoided
- Network needs to have a long operational life (>15y)
- Network has to work reliably in harsh conditions (dust, EMC, temperature)
- Network needs to be future proof

Non-stop How?

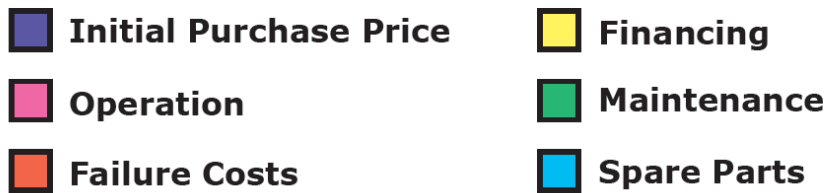
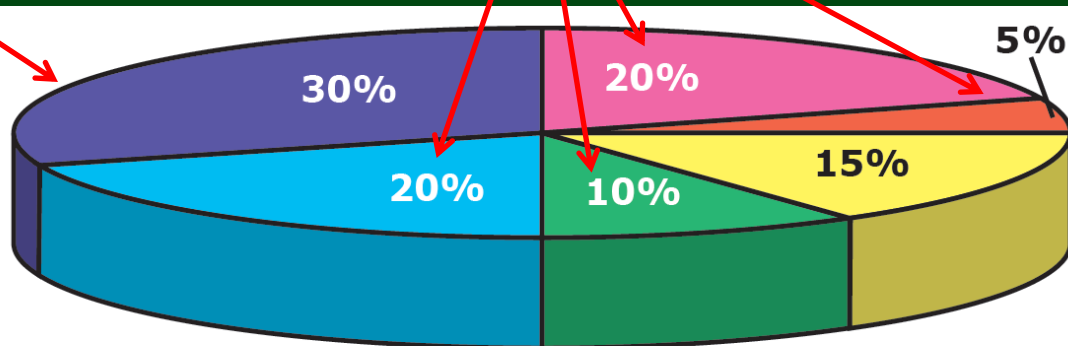
$$\text{Availability} = \frac{\text{MTBF}}{\text{MTBF} + \text{MTTR}}$$

- Network should be reliable (high MTBF) under harsh conditions
=> provide hardware & network redundancy
- Network should be easy & fast to repair (low MTTR)
=> simplicity, network mgmt tools & modular design

Conclusion

Simplicity and reliability greatly reduce operations & maintenance costs!

Typical Initial equipment cost



TCO Analysis Transportation Area

(source: UITP Core Brief on Life Cycle Cost Optimization, September 2009)

Thank you

Tom.Ceunen@otnsystems.com

+1 703 659 7419