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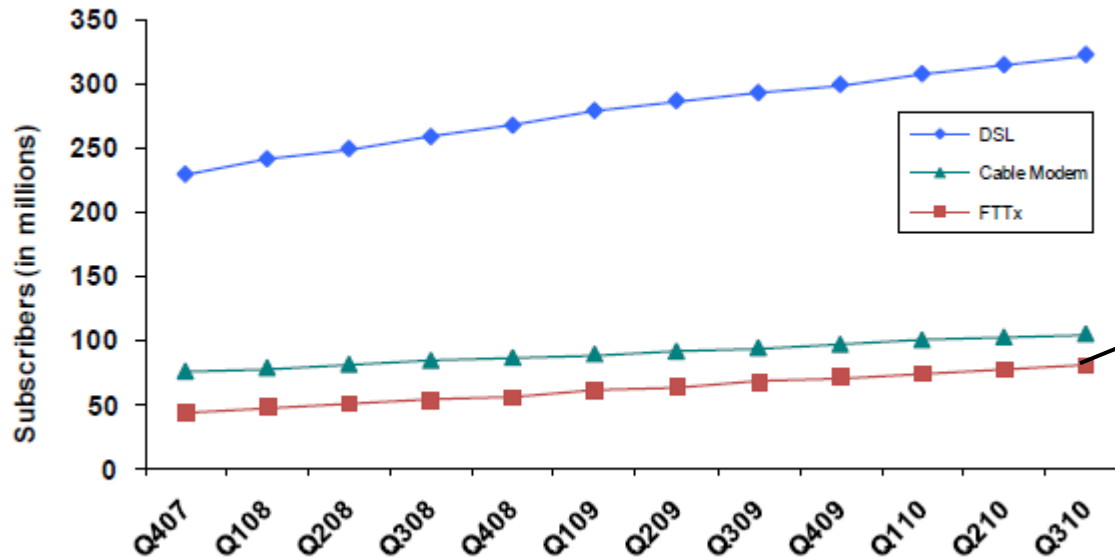
DSL Roadmap to 1~2Gbps and DSL Management (DSM)

**IEEE ComSoC SCV Town Hall Meeting
March 9, 2011**

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VP of Research @ ASSIA, Inc.**

DSL Dominates Broadband Deployment Today

Broadband Access Subscribers, Q3 2010
(Courtesy PointTopic)

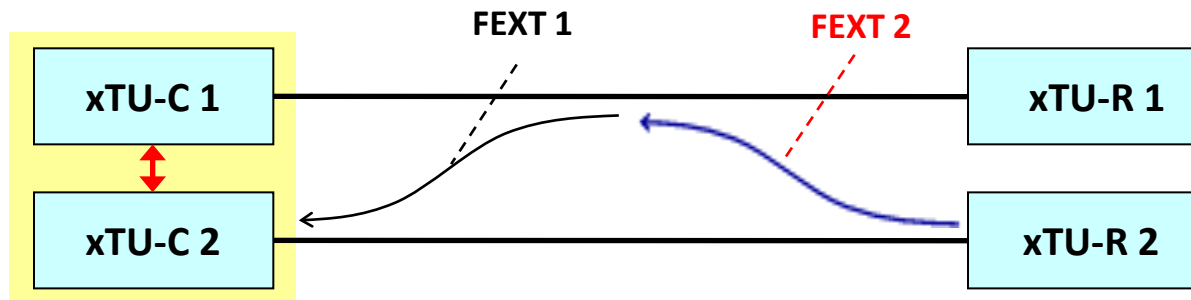


Many are FTTB
With VDSL to customer

- **Telcos investing into copper**
 - Technology matures
 - Roadmap to 1~2Gbps
 - Financial crisis

DSL Roadmap – Vectoring

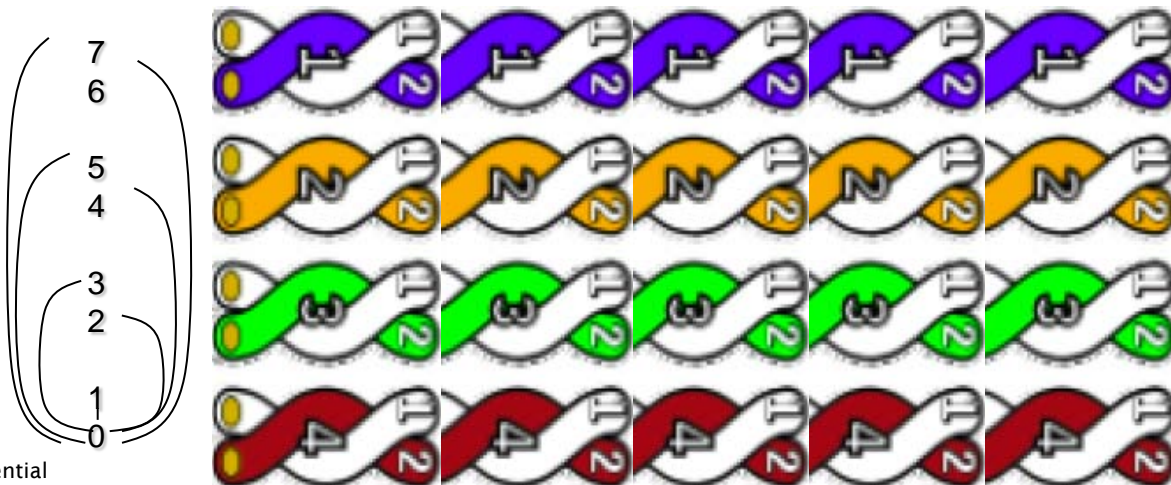
Technology	Bandwidth (MHz)	Data Rate (Typical)	Reach	Comment
ADSL1	1	8 Mbps (1~5M)	5Km	
ADSL2+	2	24Mbps (3~15M)	5Km	
VDSL2	30	100Mbps (15~50M)	1~2Km	Ramping up
Vectoring	30	200Mbps	1Km	Ready soon
Phantom	30	1Gbps	400m	Broadband World Forum
G.Fast	300	2Gbps	100~150m	Standardization



**One-sided
Coordination**

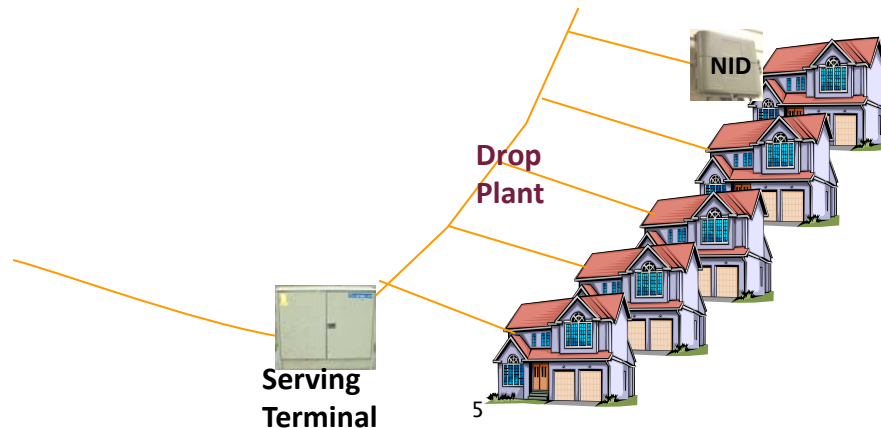
DSL Roadmap – Phantom

Technology	Bandwidth (MHz)	Data Rate (Typical)	Reach	Comment
ADSL1	1	8 Mbps (1~5M)	5Km	
ADSL2+	2	24Mbps (3~15M)	5Km	
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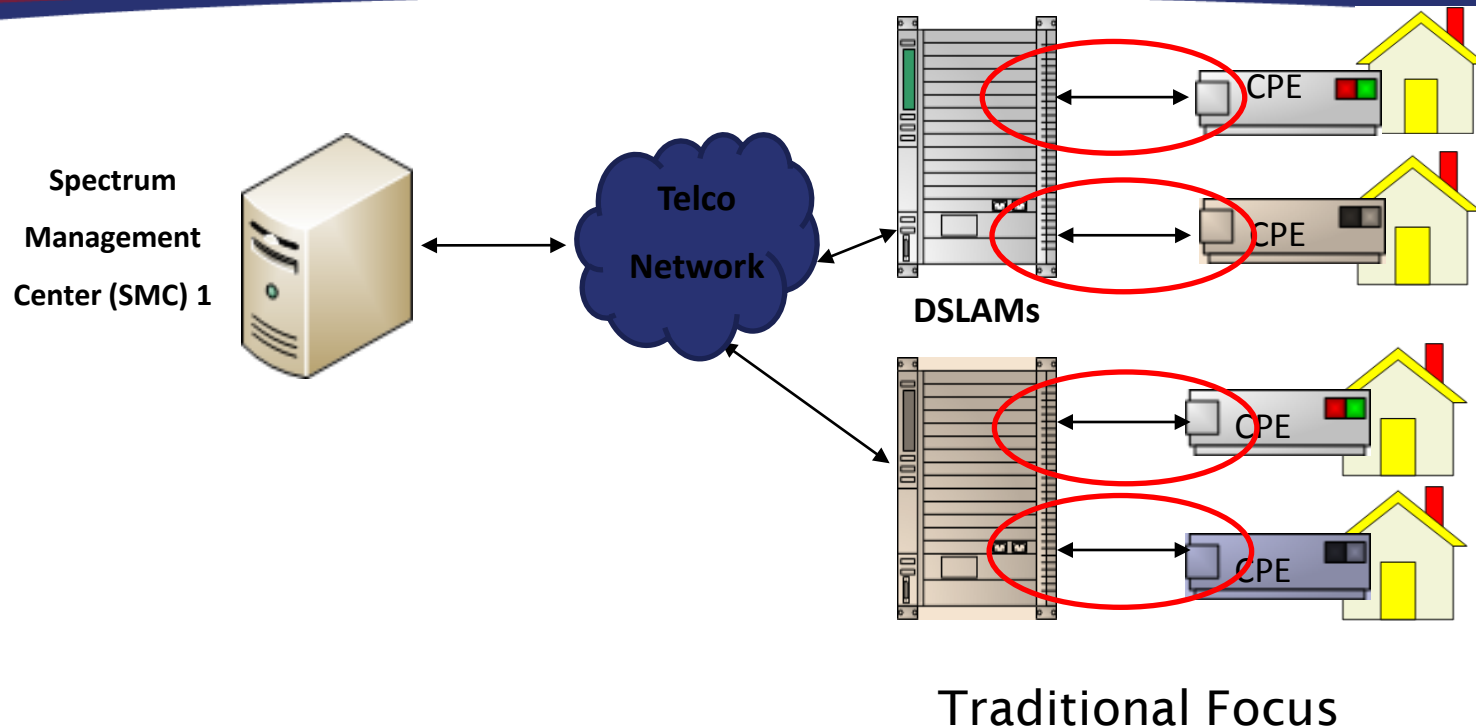


DSL Roadmap – G.fast

Technology	Bandwidth (MHz)	Data Rate (Typical)	Reach	Comment
ADSL1	1	8 Mbps (1~5M)	5Km	
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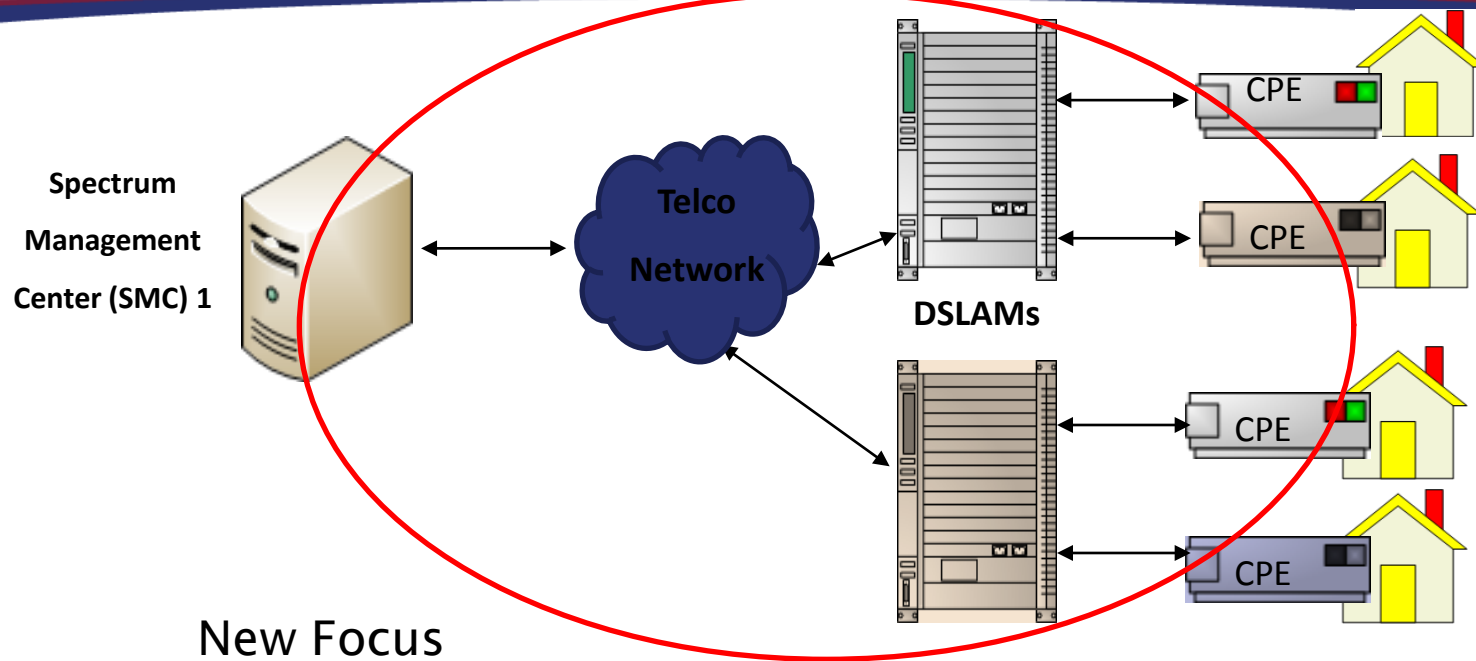


DSL Management



- **Traditional – improve modulation, coding, etc.**

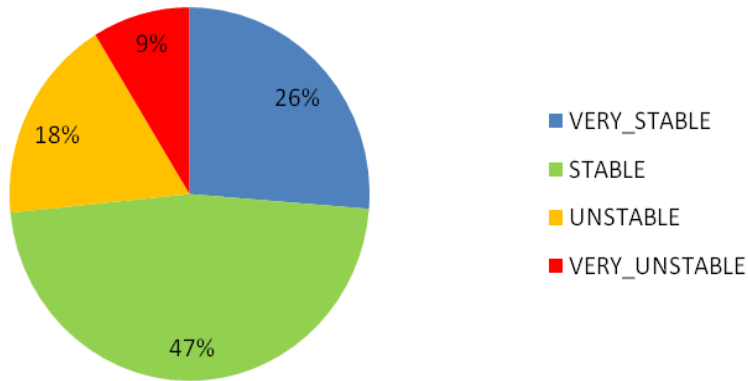
DSL Management



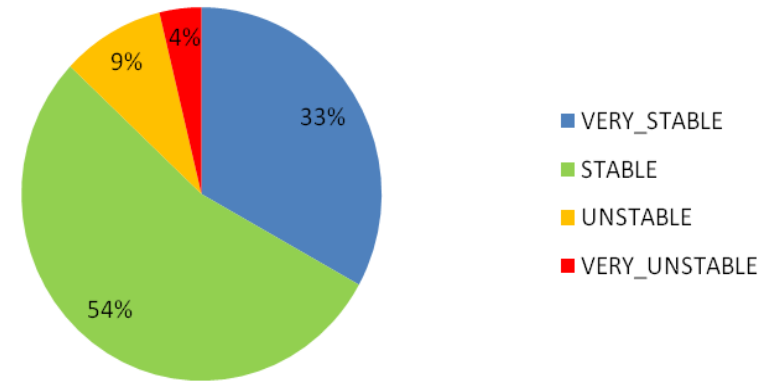
- **New – centralized upper-level algorithms**
 - Adaptive selection of parameters and policies
 - Update algorithms when needed
 - Apply to millions of lines everyday

Typical Improvement of DSM: Stability

Stability Before



Stability After



- **(Very) Unstable → Reduced by 52% (from 27% to 13%)**
- **Means reduction of:**
 - Call
 - Dispatch
 - Churn
- **Enormous cost saving**

Thank you!



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