

IPv6 in Multiservice Networks

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Jeff Doyle



A Buzzword Circus....

Triple Play

MULTISERVICE NETWORK:

1. A network delivering more than one service to the consumer, in which each service places distinctly different quality demands on the transport infrastructure.
2. Something you've gotta support these days if you want to survive as a service provider.

Typical Services (Select Two or More)

- Internet Access
- Voice
- Entertainment-Quality Video
- Wireless and Mobile
- L2 VPNs
- L3 VPNs
- Metro (and beyond) Ethernet
- . . .

Multiservice Drivers

- Commoditized IP transport
- Converged infrastructure
- Protection of core business
- Branding of bundled services = cheaper marketing and advertising
- Customer appeal?
 - One provider
 - One interface
 - One bill

Reality Sets In...

- Everyone has basically the same business plan
- Do users really want this??
- Is this another optical or 3G story?
- Multiservice itself becomes commoditized
 - But can't survive without it

What Problem(s) Does Multiservice Solve?

- Possibility of service interplay

What Does This Have To Do With IPv6?

Assume 10 M Subscribers

Devices per home:

Television	2
Computer	2
Phone	2
Game player	1
Utility meter	1
	<hr/>
	8

Total Devices = 80M

Case Study

Comcast



Comcast IPv6 Drivers and Goals

- Management of huge home network base
 - 10/8 private IPv4 space depleted in 2005
- Later, public IPv6 access

20 million video subscribers

2.5 set-top boxes (STBs) per customer

2 IP addresses per STB

Total: 100 Million IP addresses

Adding Triple Play to the Formula...

	2005 HSD Only	2006 + Triple Play
Cable Modem (CM)	1 (private only)	1
Home Computer/ Router	1	1
eMTA (voice adaptor)	0	1 - 2
Set Top Box (STB)	0	2
Total Number of IP Addresses (assuming 2.5 STBs per household)	1 - 2	8 - 9

Comcast: Natural Growth vs New Services

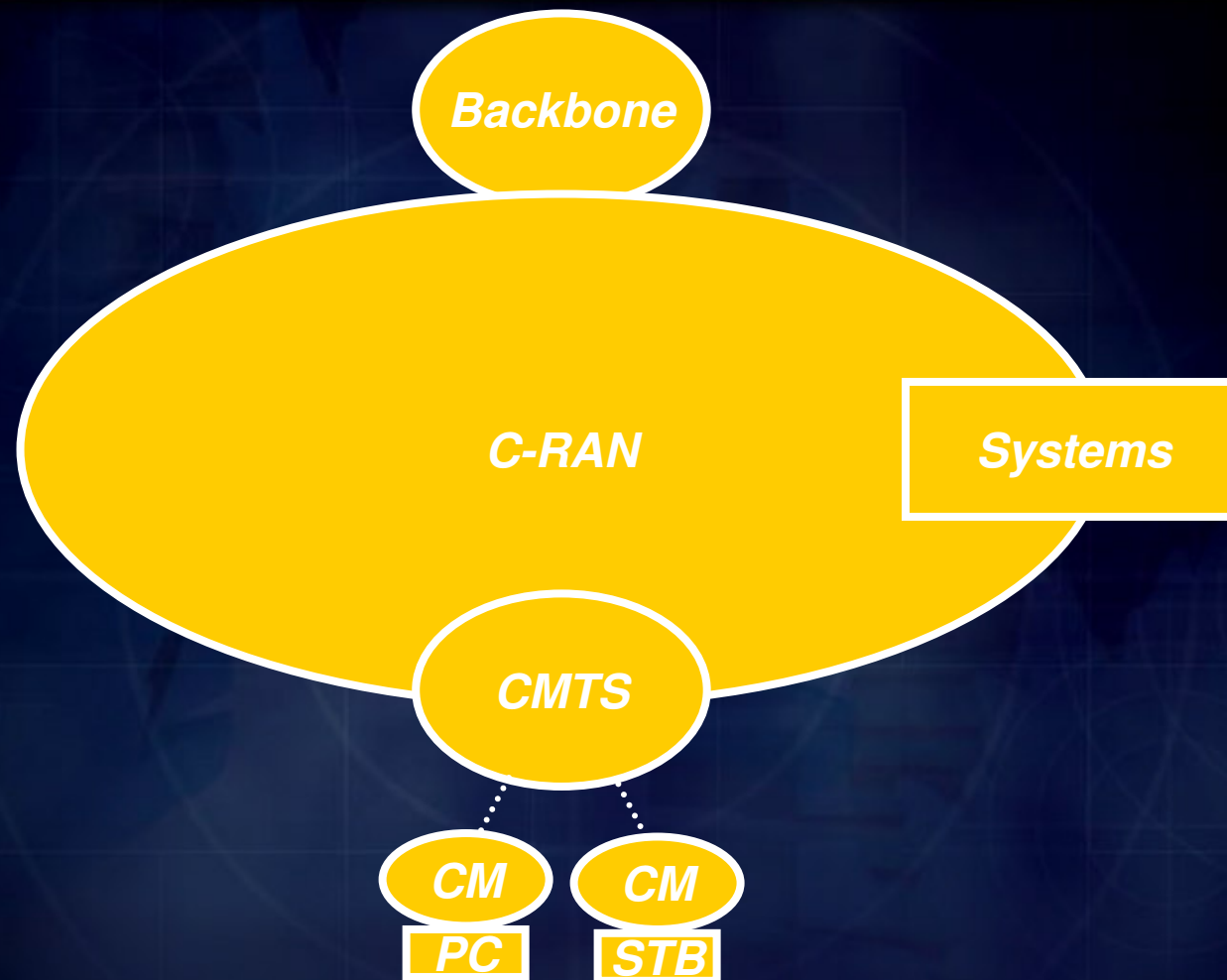


Note: this graph shows trends, not actual data

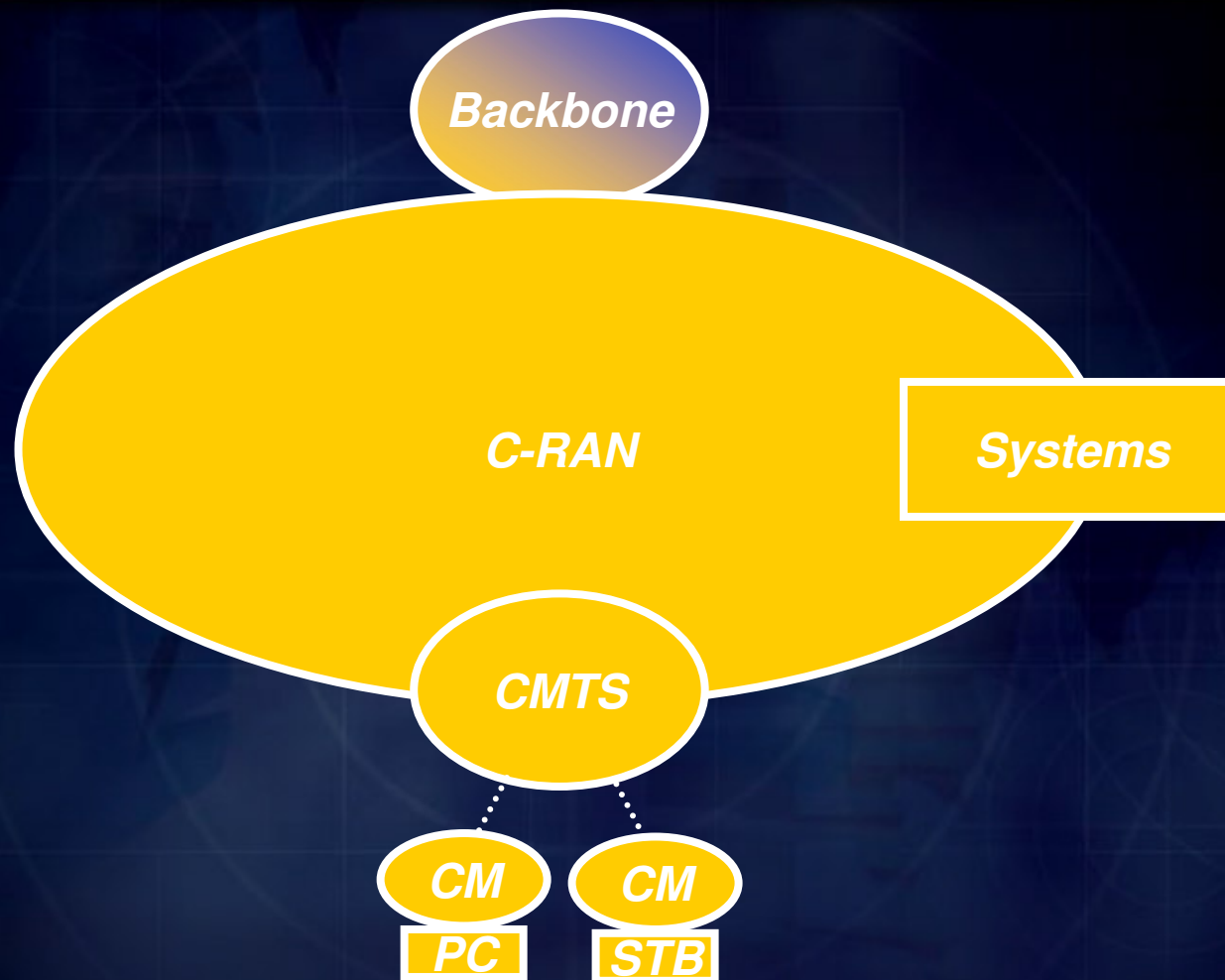
Comcast Transition Plan

1. Begin with backbone
 - Already completed
2. Backoffice
 - Not all backoffice systems need to know IPv6
3. Comcast Regional Access Networks (C-RANs)
4. CMTS platforms
5. Home systems
 - STBs
 - MTAs
 - Routers/ Hosts
6. Public access

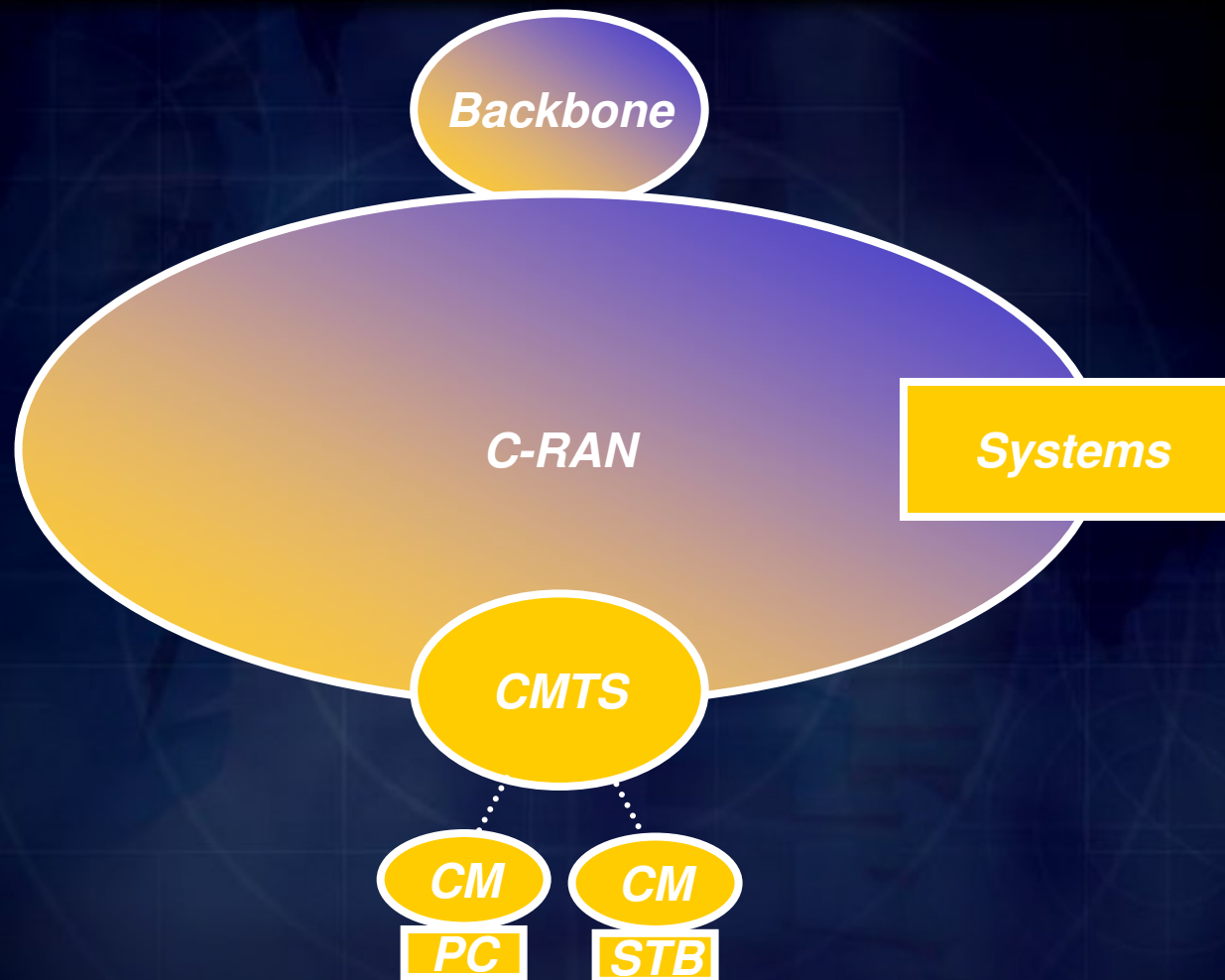
Today: Pure IPv4



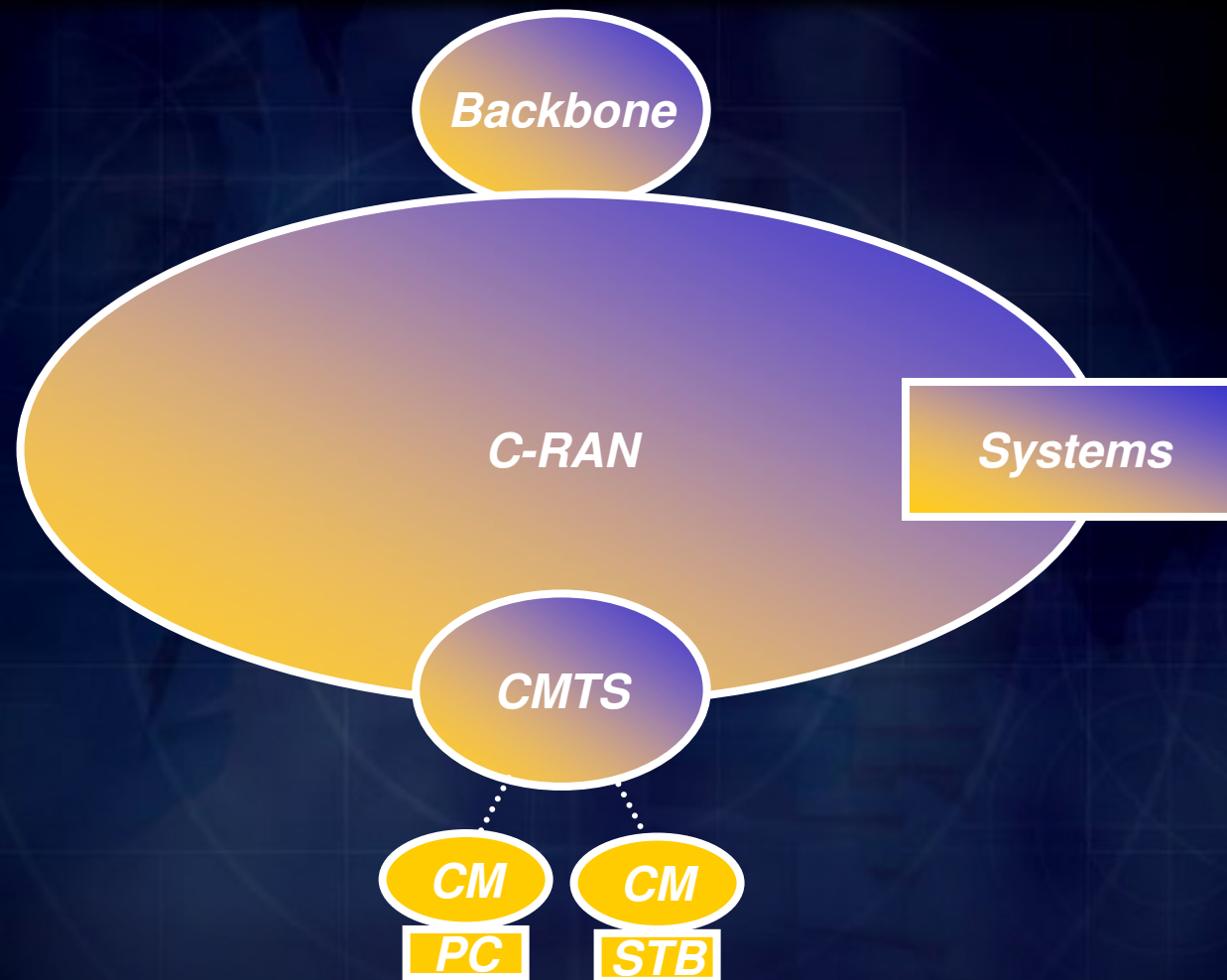
Step 1: Backbone



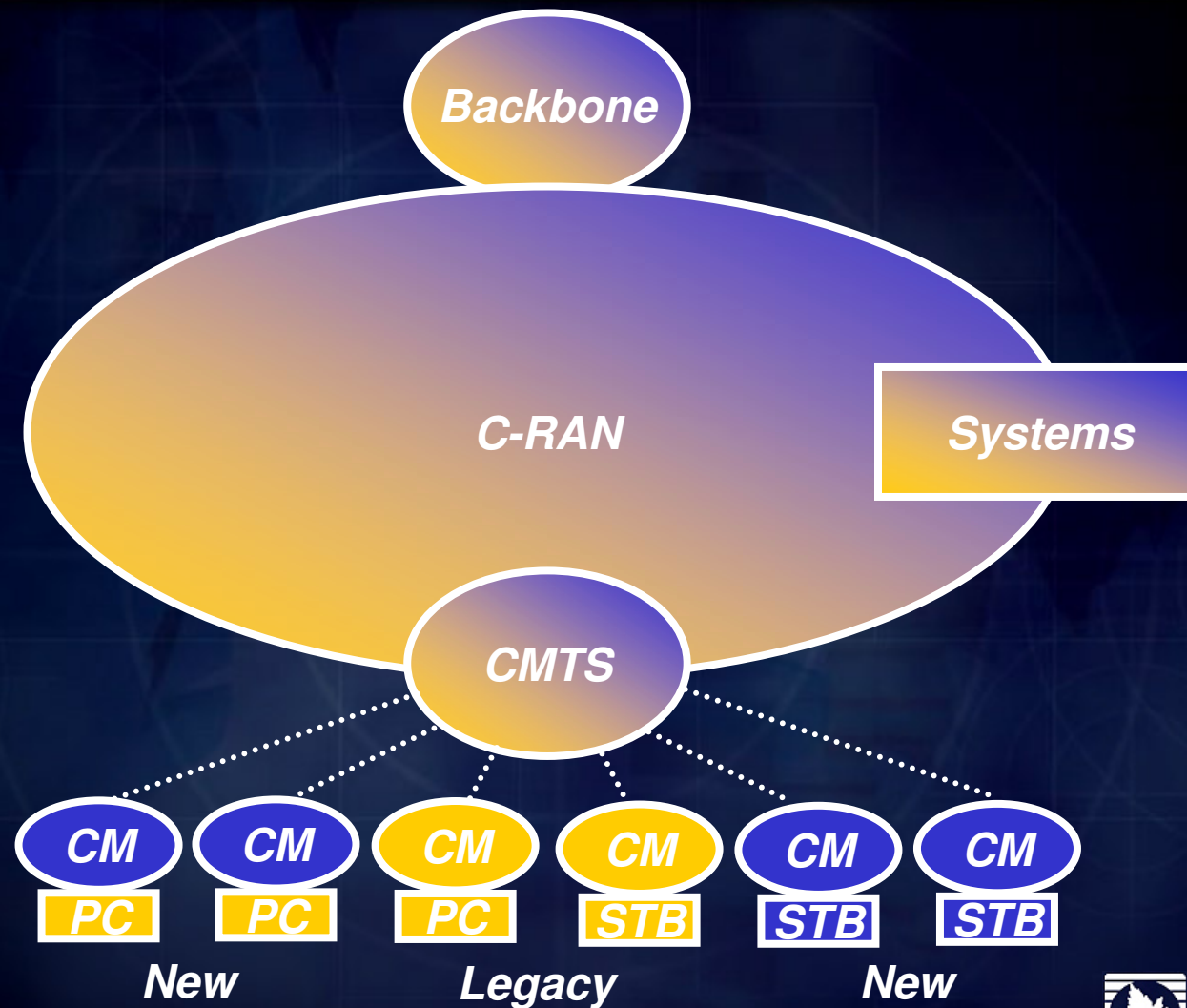
Step 2: C-RAN



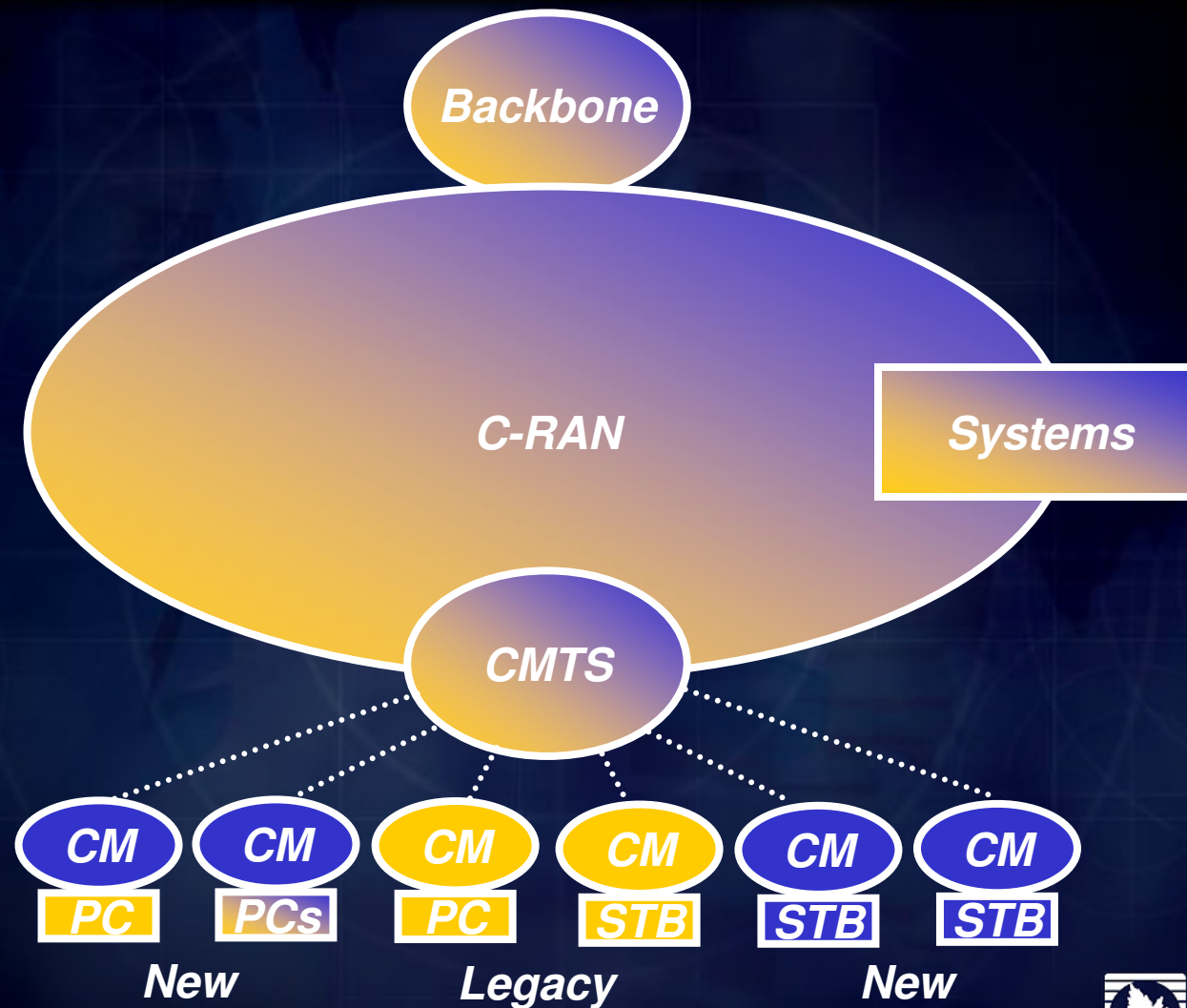
Step 3: CMTS & Systems



Step 4: Modems & STB



Step 5: IPv6 to the Home Networks



First PING on Comcast 10GE Backbone ...

```
ping ipv6 2001:558:0:f501::1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 2001:558:0:f501::1, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 3/5/14 ms
```

```
Jun  2 09:31:49.589, len: 162, hits: 1, i/p i/f: TenGigE0/7/0/0
```

```
00146a7d 29810014 6ac4dd08 86dd6000 0000006c 3a3c2001 05580000 f5010000  
00000000 00022001 05580000 f5010000 00000000 00018000 50fae0da 00004480  
3e53000f 062b0809 0a0b0c0d 0e0f1011 ...
```

```
Jun  2 09:31:53.533, len: 162, hits: 1, i/p i/f: TenGigE0/0/0/0
```

```
00146ac4 dd080014 6a7d2981 86dd6000 0000006c 3a402001 05580000 f5010000  
00000000 00012001 05580000 f5010000 00000000 00028100 4ffae0da 00004480  
3e53000f 062b0809 0a0b0c0d 0e0f1011 ...
```

Advantages of Comcast Transition Plan

- Initially, IPv6 domain completely private
 - Customers do not “touch” it
 - Translation, tunneling not an issue
- Incremental, hierarchical transition
- Allows extended training and operational experience period before “going public”
- Time to research effects
- Time to pressure vendors as needed

Thank You
jeff@juniper.net

