Costs of Content Delivery
WIE 2013 San Diego

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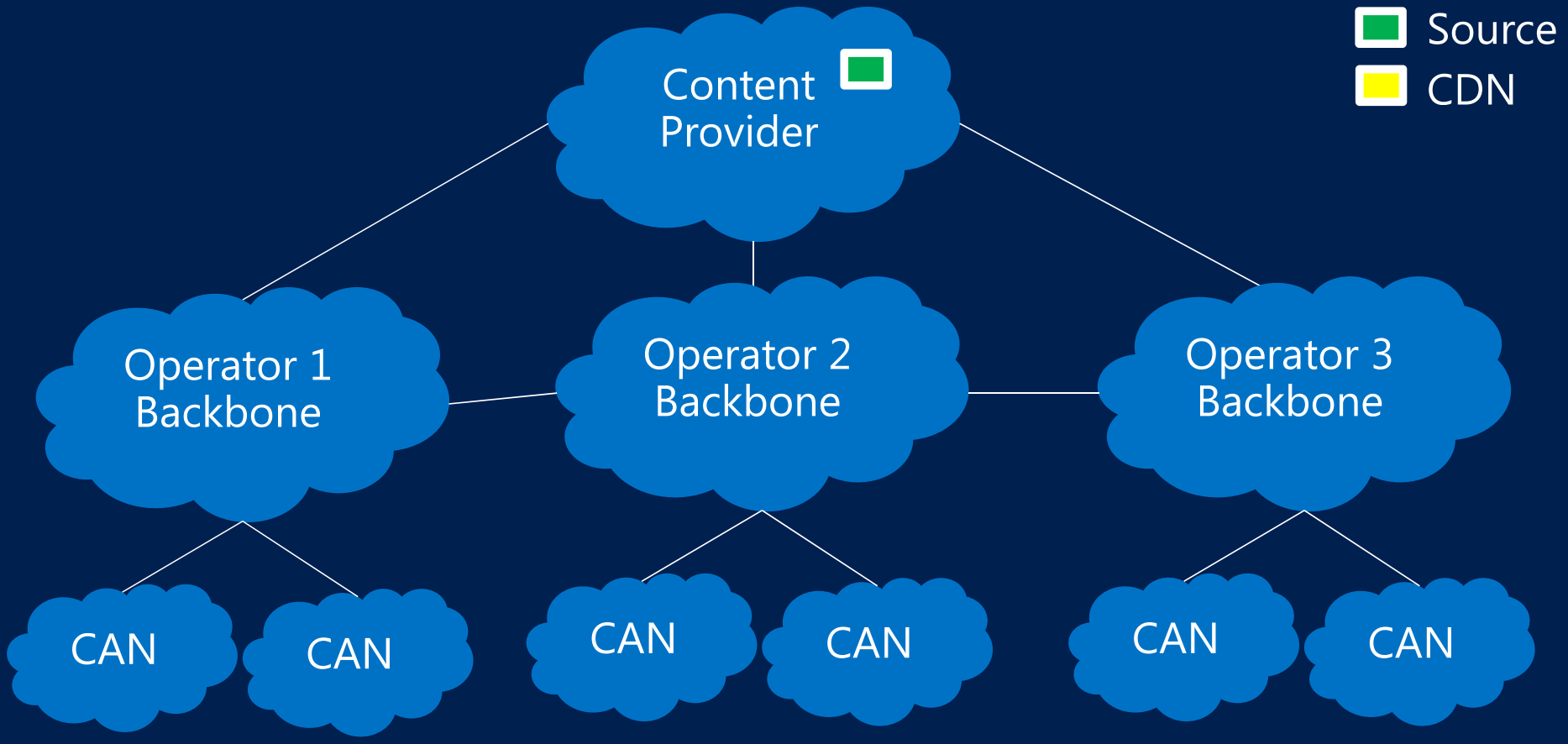
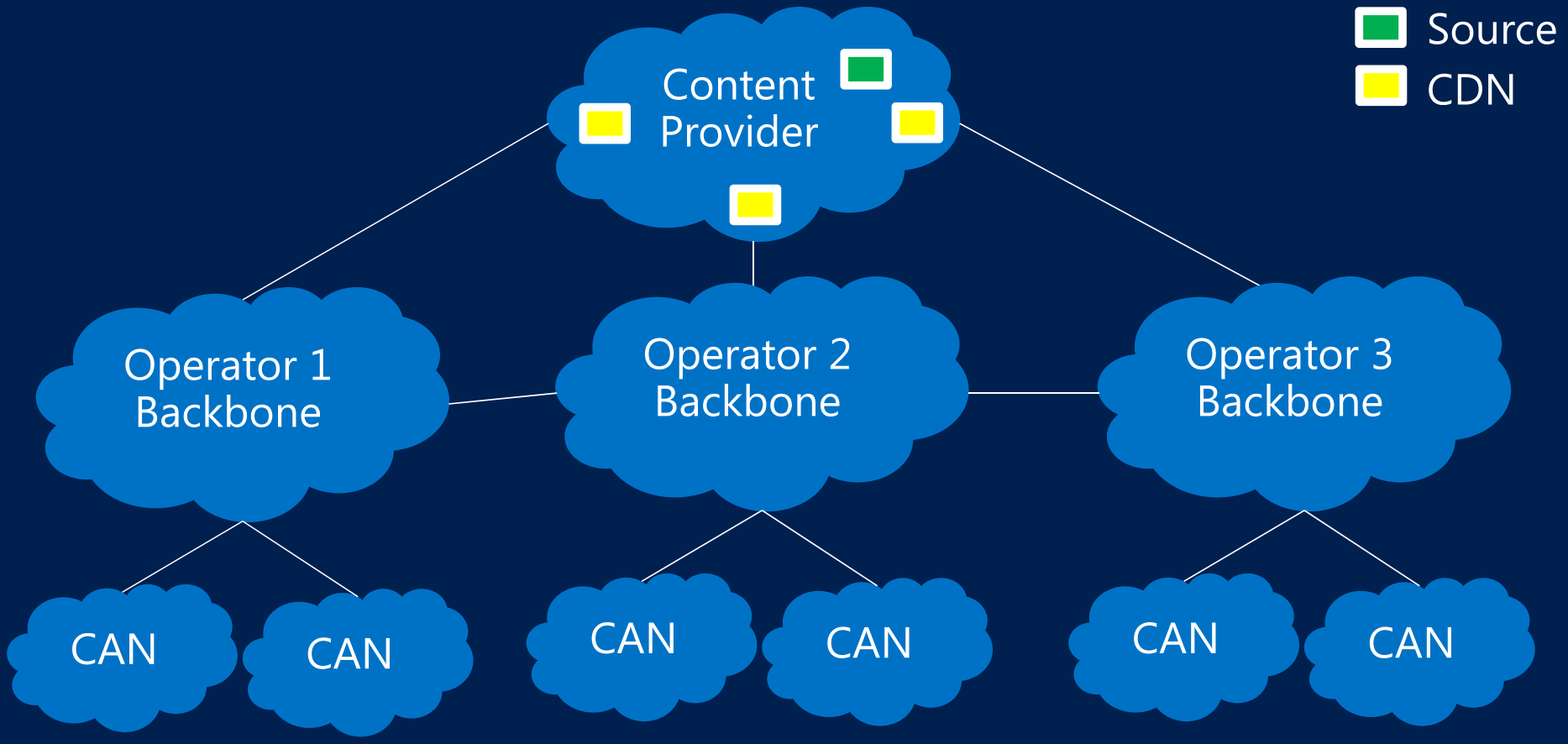
No CDN


Source
CDN
Content Provider
Operator 1 Backbone
Operator 2 Backbone
Operator 3 Backbone
CAN
CAN
CAN
CAN
CAN
CAN

On-net CDN


Source
CDN
Content Provider
Operator 1 Backbone
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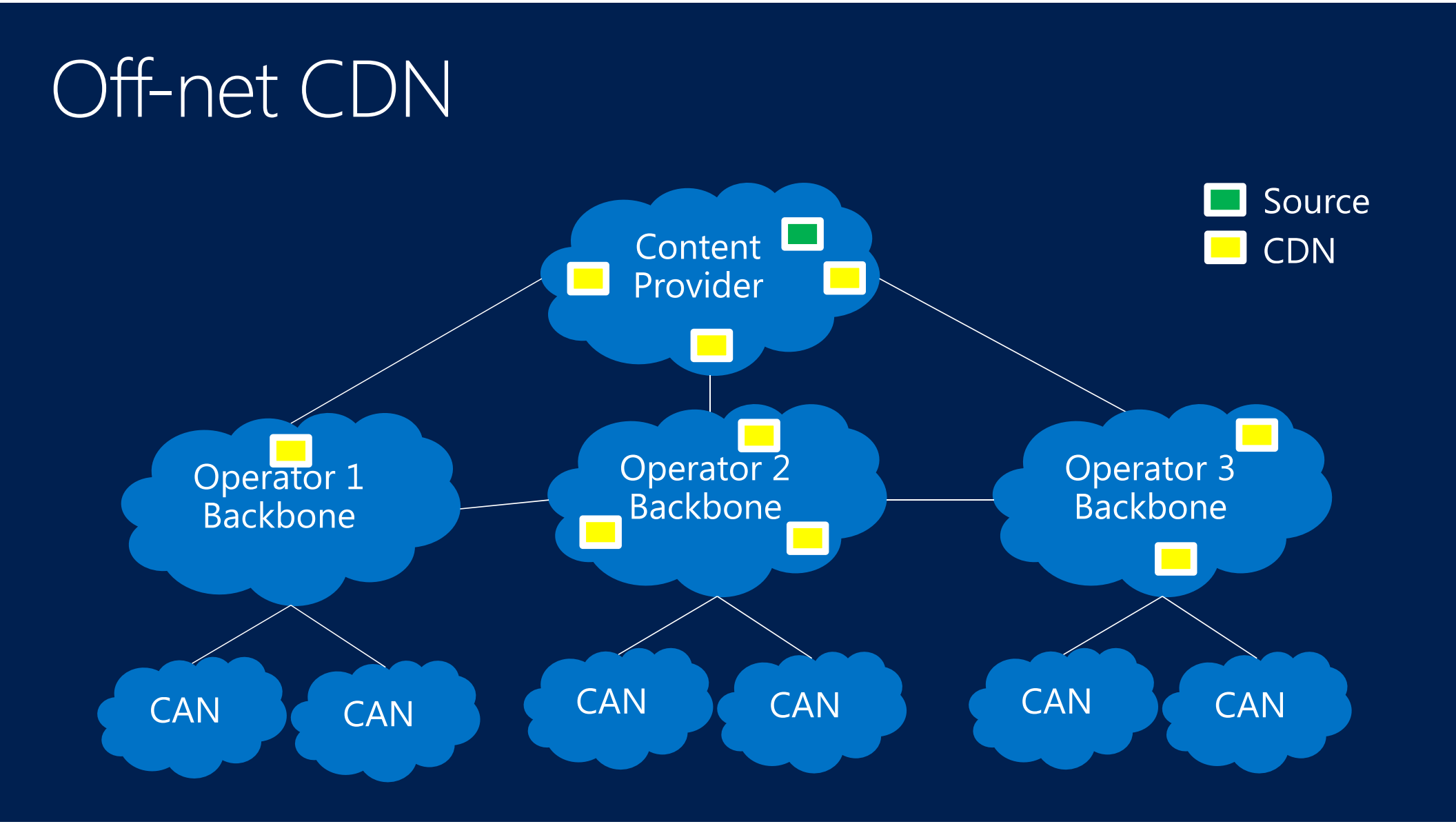
CAN
CAN
CAN
CAN
CAN
CAN

Off-net CDN


Source
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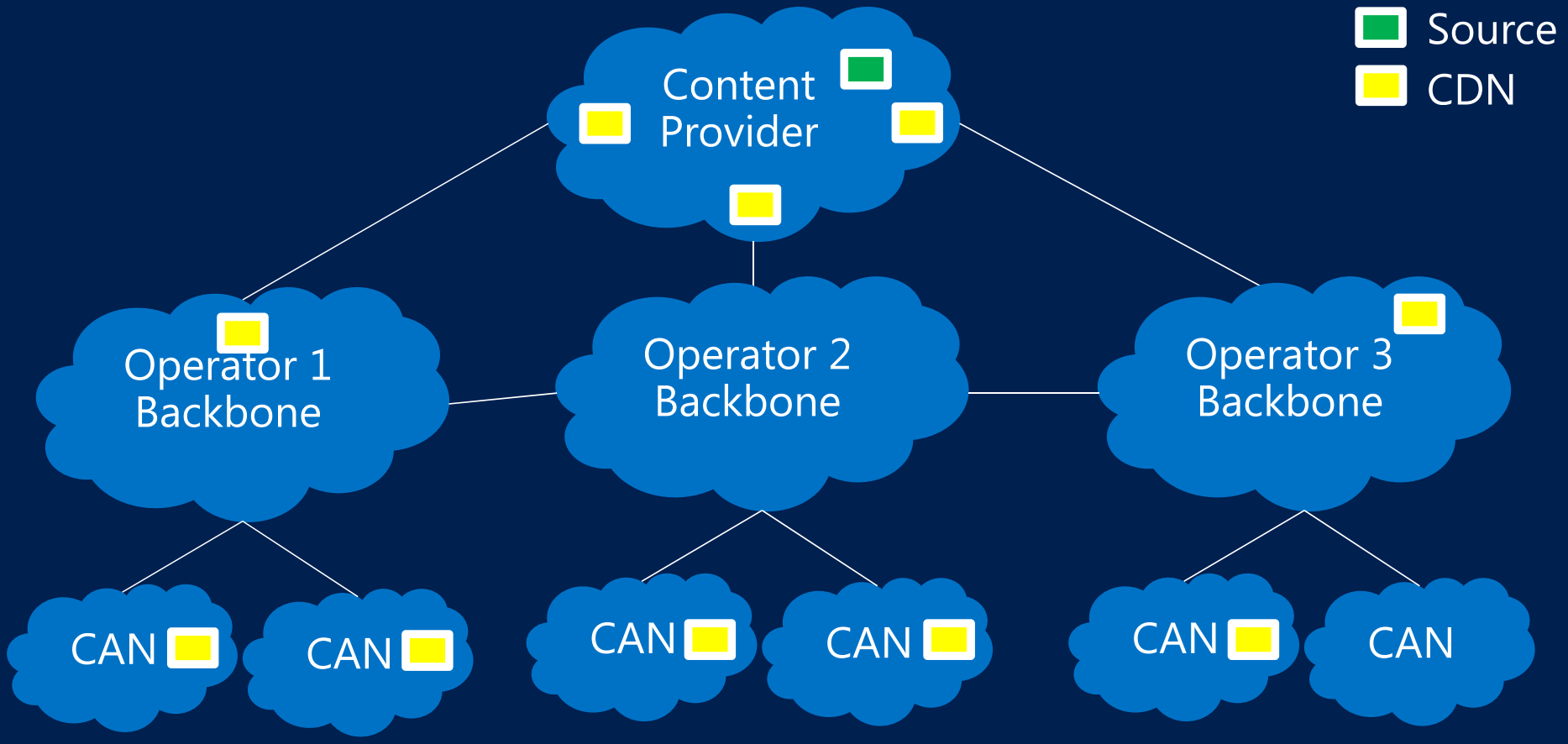
CAN
CAN
CAN
CAN
CAN
CAN

Deep fff-net CDN



Costs to Content Providers

	No CDN	On-net	Off-net	Deep off-net
User Experience	Low	Medium	High	Very High
Interconnection	High	High	Low	Low
Backbone	High	Medium	Low	Very Low
Colo	High	High	Nil	Nil
Machines	Medium	Medium	Trending to High	Trending to High
Metro Transport	Nil	Medium	Nil	Nil

Costs to Operators

	No CDN	On-net	Off-net	Deep off-net
User Experience	Low	Medium	High	Very High
Interconnection	High	High	Low	Low
Backbone	High	High	Medium	Low
Colo	Nil	Nil	Medium	Low

Better Cooperation

- Trend towards On-net -> off-net -> deep off-net
- Increases user experience
- Reduces cost to Operators backbone
- Reduces interconnection costs for Operators and CDNs
- But, moves colo cost from CDN to Operator
- Reaching saturation of off-net deployments, diminishing returns for tail end Operators
- Uptake of deep-off net not fast enough, why?

Better Cooperation

- Cache-to-cache off-net traffic can become unpredictable and unmanageable for Operators
- Operators forced to augment capacity to meet the CDN's requirements on their backbone and provide colo to support CDN
- CDNs should "play nice", predictable A-Z flows, work with Operators to match their backbone capabilities with CDN needs

Research Areas?

- "CDN off-net depth" & "Flow A-Z Predictability for CDNs"
- Operators would prefer deep and predictable CDNs
- CDNs desire to be deeper off-net
- Can you rate a CDNs predictability?
- Can you rate a Operators off-net depth track record for the CDNs they support?
- Would this change behaviors?

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