

(Introduction to)
Intra-Doman Virtual Aggregation

<http://www.ietf.org/internet-drafts/draft-francis-idr-intra-va-00.txt>

Paul Francis, Cornell Univ
Xiaohu Xu, Huawei

Goal of this talk:

Introduce Virtual Aggregation (VA) to IDR

Discuss what it would take for IDR to adopt VA as a standards-track work item

Goal of Virtual Aggregation (VA):

Shrink the FIB

Easily 5x to 10x (with little perf penalty)

In any and all routers

Deploy autonomously by any ISP

No externally-visible change

Minor changes to routers

Actually, can do it with legacy routers with various config tricks

Works with mix of VA and legacy routers

Who needs this?

Many ISPs try to shrink FIBs today

To extend the life of routers

Two main approaches:

In edge routers: default route to core

Only where external peers don't require full BGP tables

And ISP actually has a core

Simply ignore some routes (/24...)

Who needs this?

Important for many small ISPs today

May be much more important as IPv4 addresses run out and aggregation breaks down

And IPv6 picks up??? ;)

How it works

Partition address space into “Virtual Prefixes” (VP)

VPs must be bigger than real prefixes

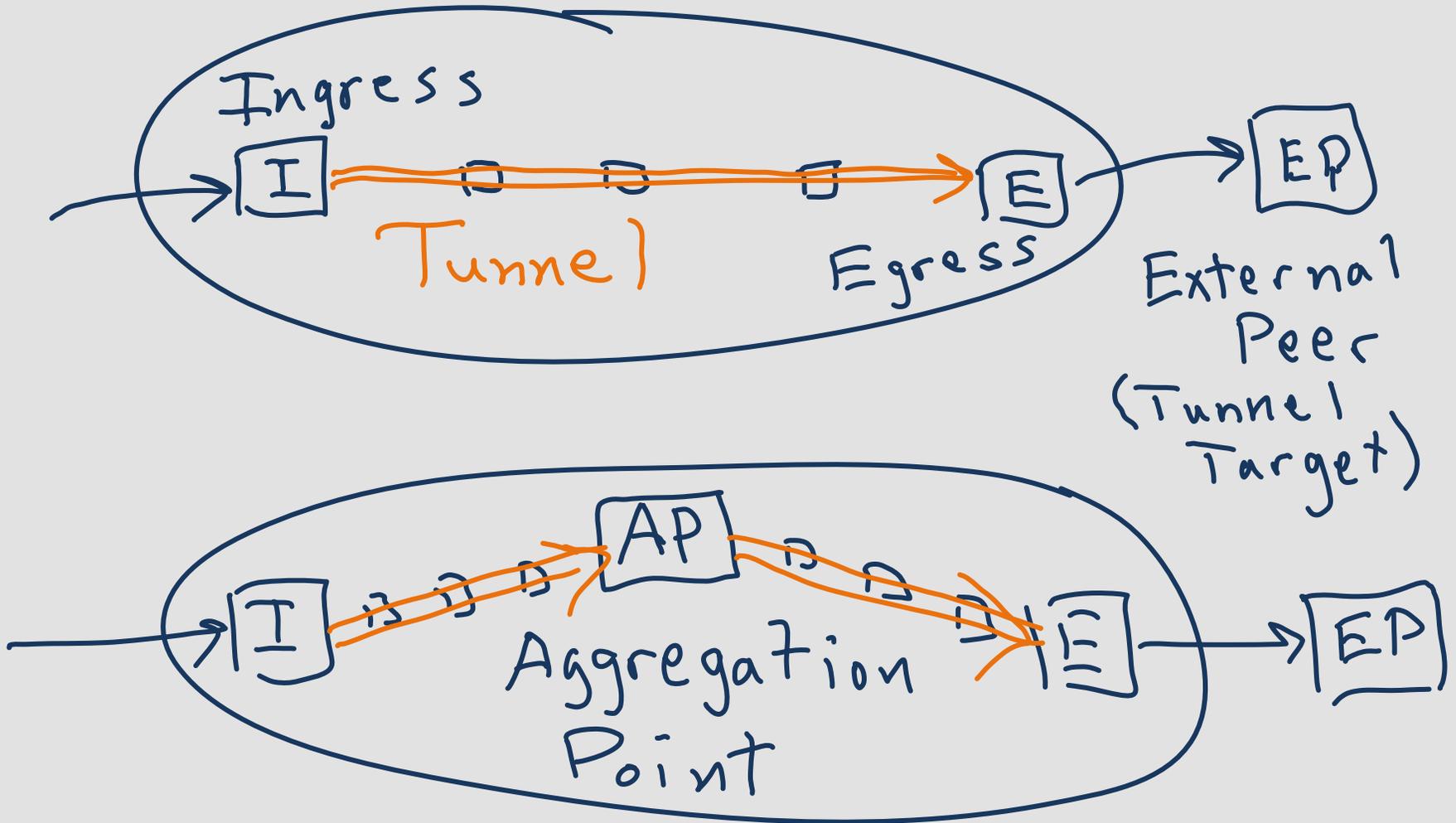
(/2, /3, . . . /9 . . .)

Specific routers know routes for “sub-prefixes” within specific VPs

“Aggregation Points”

Other routers do not require those sub-prefixes

Paths through the ISP



FIB Suppression

RIB contains all routes

BGP operation doesn't change

After decision process, router decides whether or not to “suppress route”

Not install it in the FIB

What routes cannot be suppressed?

VP routes to Aggregation Points (AP)

If router is AP, sub-prefix routes within VP

All other routes may be suppressed

But don't have to be, depending on FIB space

Required tunnels (MPLS)

(Required by VA routers and legacy routers alike)

From all routers to all APs

From all routers to all external peers

External peer is target, but egress router strips MPLS header

New Configuration

Select Virtual Prefixes (VPs)

Assign Aggregation Points (APs)

Keep AP redundancy and traffic engineering in mind

(Optionally) select sub-prefixes that should additionally be installed

This could be mostly automatic by router

New failure mode

Aggregation Point (AP) failure

Backup APs must exist

Failover to backup is automatic with BGP

(Dynamic AP selection a possibility)

Next steps (for discussion)

Write 01 draft

Including very helpful suggestions from
Daniel Ginsburg and Robert Raszuk

Have IDR consensus to adopt VA as a
standards-track work item by Nov
meeting