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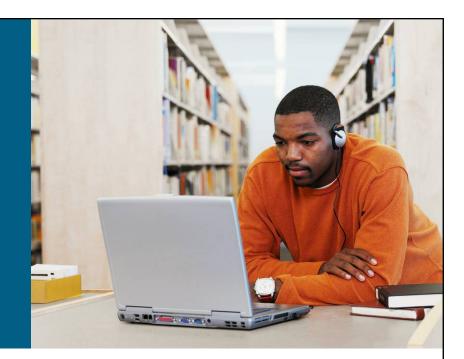
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#### Designing a Routing Protocol Deployment



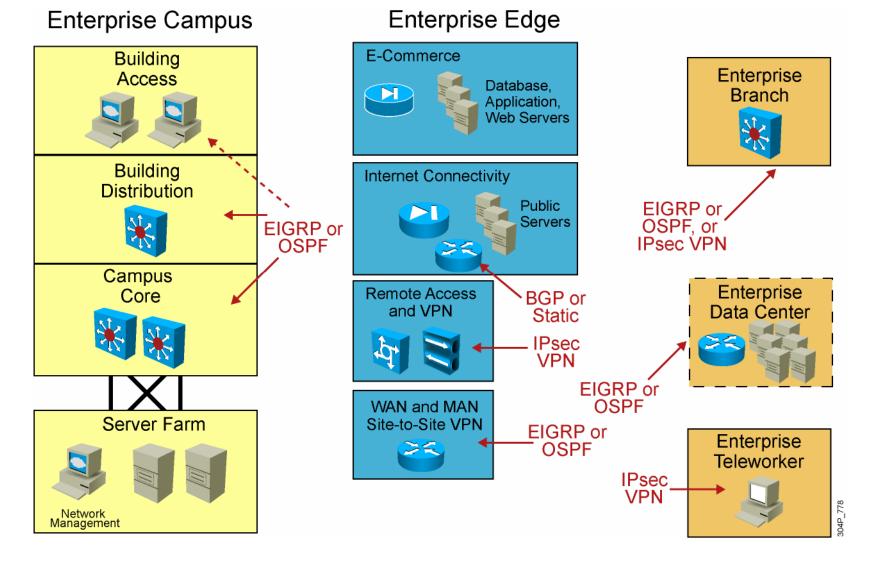
#### **Designing IP Addressing and Selecting Routing Protocols**

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#### **Routing Protocols in the Enterprise Architecture**

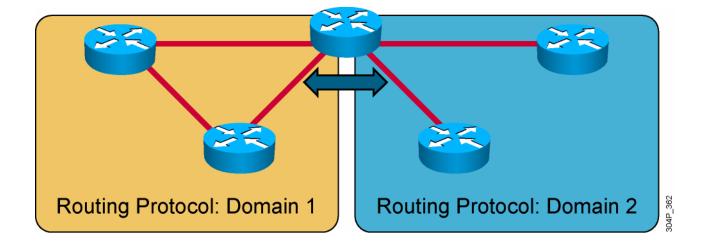


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#### **Route Redistribution**



Redistribution on routing protocols and domain boundaries occurs on the router.

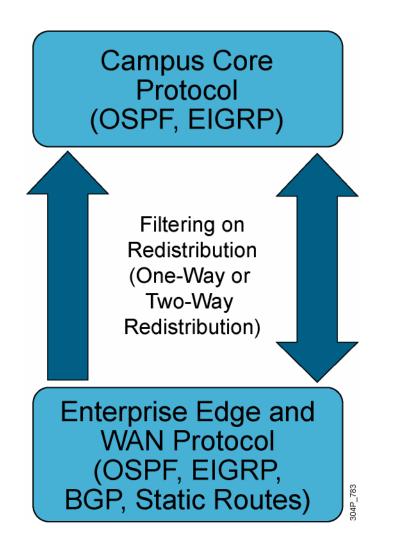
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#### **Route Redistribution Direction**

- Redistribution of routing protocols (boundary router)
- One-way redistribution in one direction (for example, from enterprise edge to campus core)
- Two-way redistribution in both directions



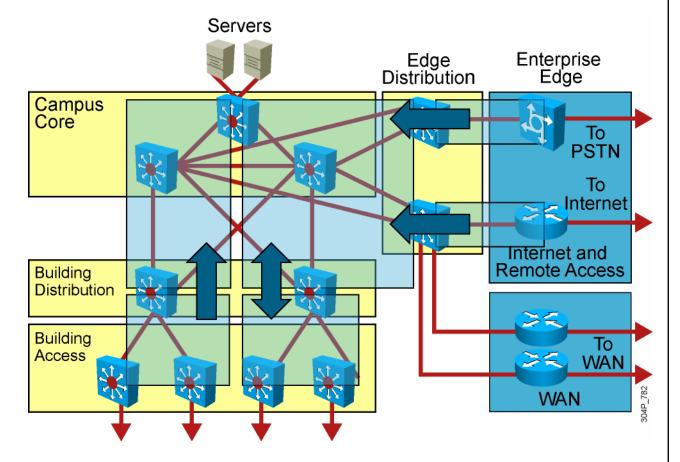
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## Route Redistribution in the Enterprise Network

Redistribution:

- From selected building access protocols
- Between campus core and WAN routers
- From static routes to enterprise IGP
- Static routes or BGP routes into enterprise IGP



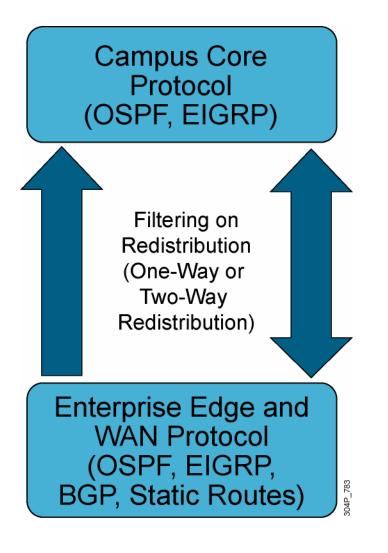
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### **Route Filtering**

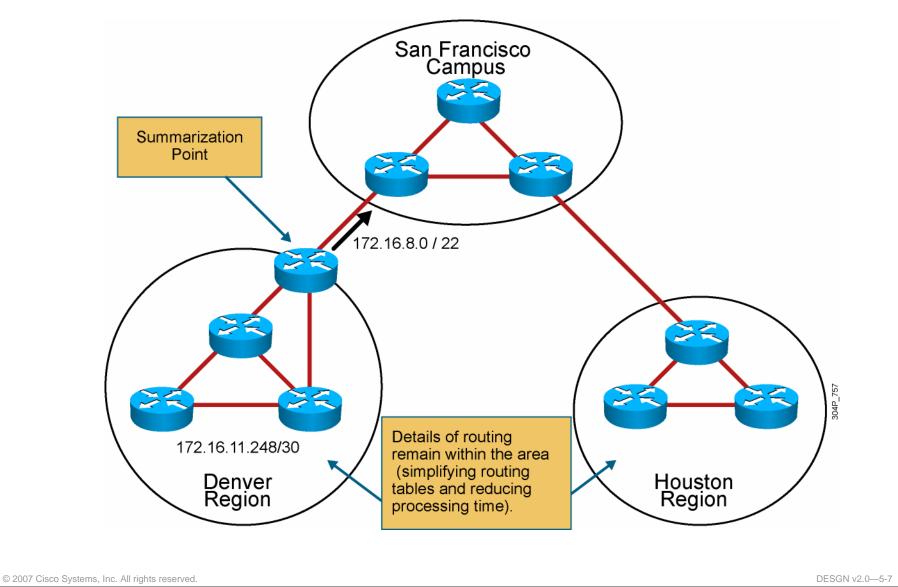
Filtering upon redistribution:

- Avoids routing loops
- Avoids suboptimal routing
- Prevents certain routes from entering routing domain



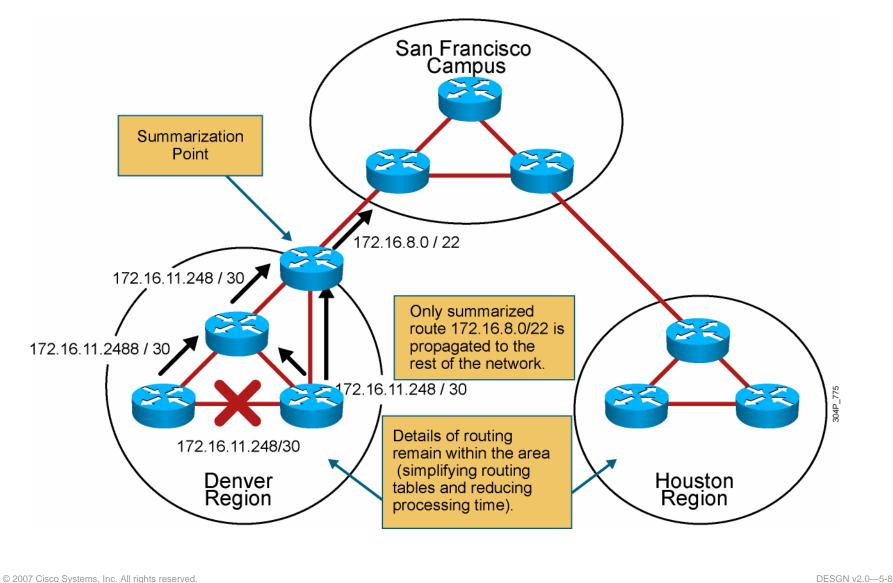
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#### **Route Summarization**



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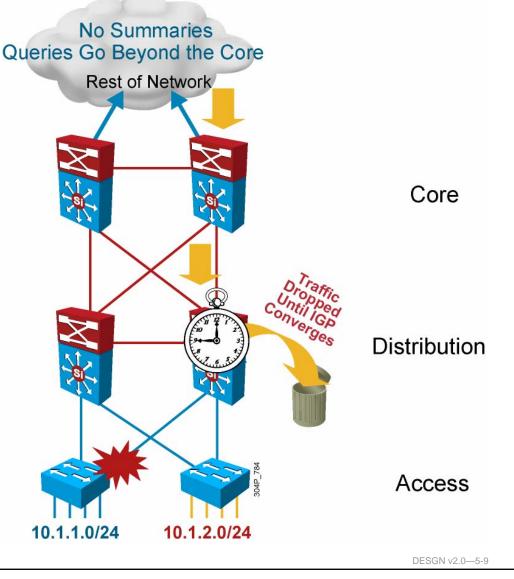
#### **Route Summarization**



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#### **Recommended Practice: Summarize at the Distribution Layer**

- It is important to force summarization at the distribution layer toward the core.
- After link failure, for return path traffic, an OSPF or EIGRP reroute is required.

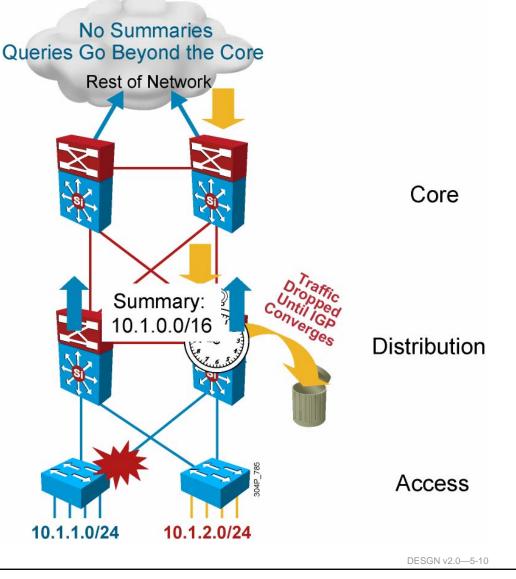


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- It is important to force summarization at the distribution layer toward the core.
- After link failure, for return path traffic, an OSPF or EIGRP reroute is required.
- Summaries limit the number of peers an EIGRP router must query or the number of LSAs an OSPF peer must process.

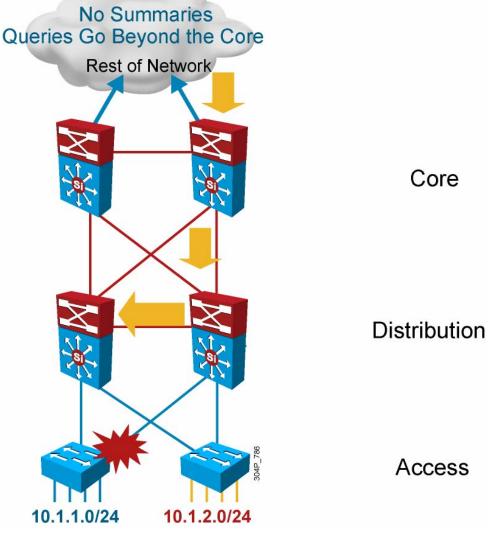


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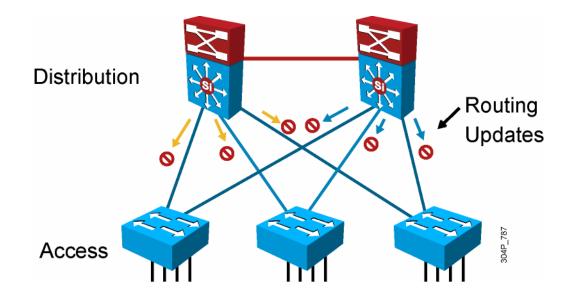
- It is important to force summarization at the distribution layer toward the core.
- After link failure, for return path traffic, an OSPF or EIGRP reroute is required.
- Summaries limit the number of peers an EIGRP router must query or the number of LSAs an OSPF peer must process.
- Summaries allow faster reroutes.



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#### **Recommended Practice: Passive Interfaces for IGP at Access Layer**



- Limit unnecessary peering
- Without passive interface:
  - With four VLANs per wiring closet
  - 12 adjacencies total
  - Memory and CPU requirements increased with no real benefit
  - Creates overhead for IGP

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#### Summary

- Large networks may implement multiple protocols for different modules of the Cisco Enterprise Architecture.
- Advanced routing features such as redistribution, filtering, and summarization allow multiple routing protocols to coexist and provide greater scalability.
  - Redistribution between different routing protocols passes routing knowledge from one protocol to another.
  - Route filtering prevents advertisement of certain routes through the routing domain.
  - Route summarization and an IP hierarchy reduce routing traffic and unnecessary route recomputation.

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