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RADIUS Roaming: Issues and Solutions

Karri Huhtanen
Arch Red Oy
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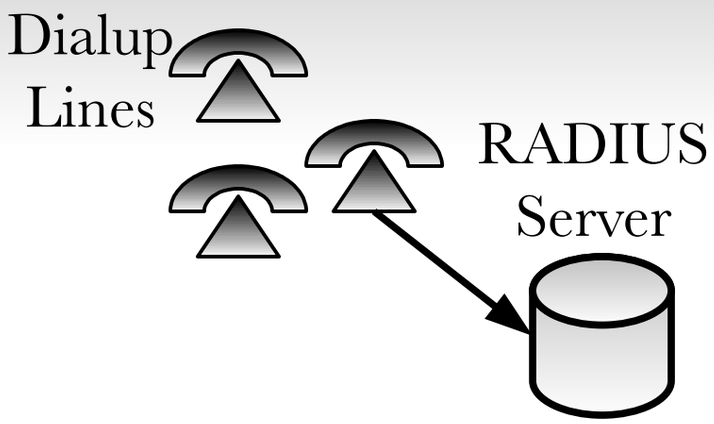
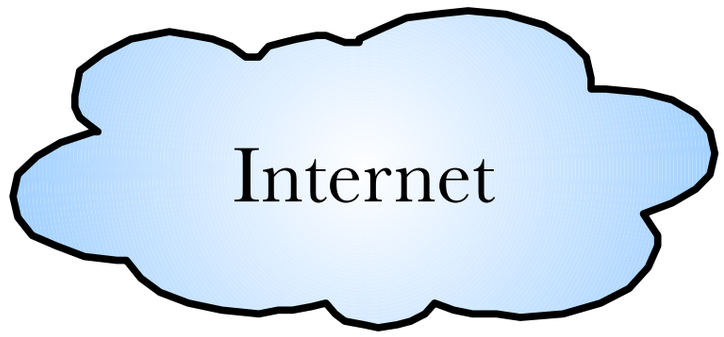
A long time ago...





Remote Authentication Dial In User Service (RADIUS)

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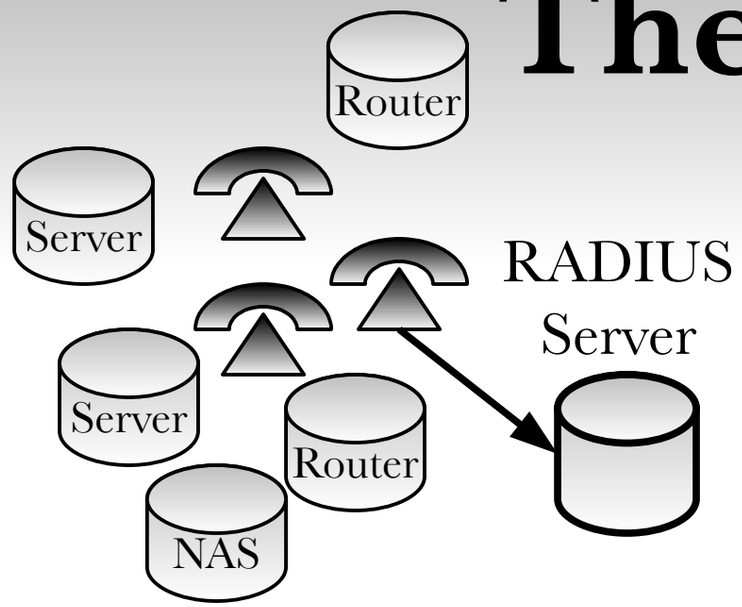
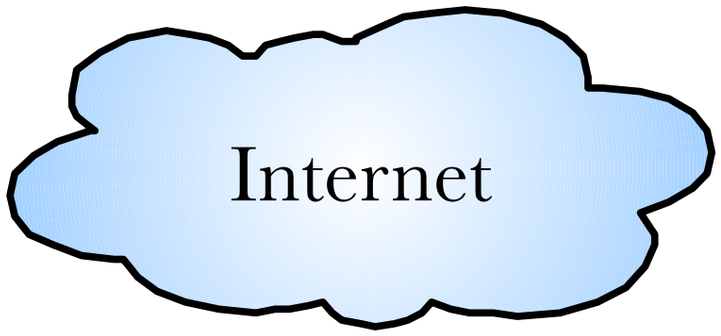
Then came the NASes





Network Access Server (NAS)

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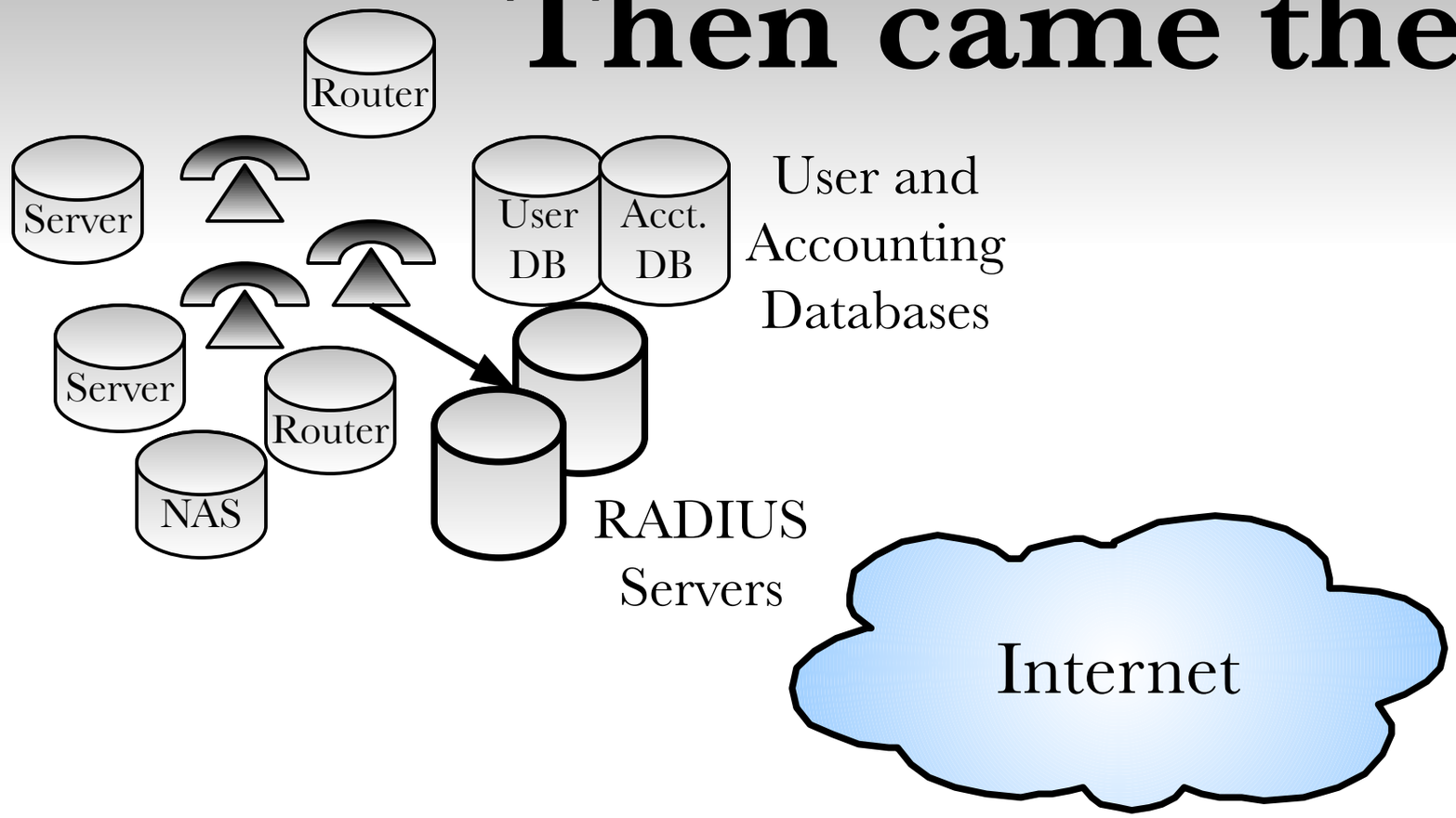
Then came the SLAs



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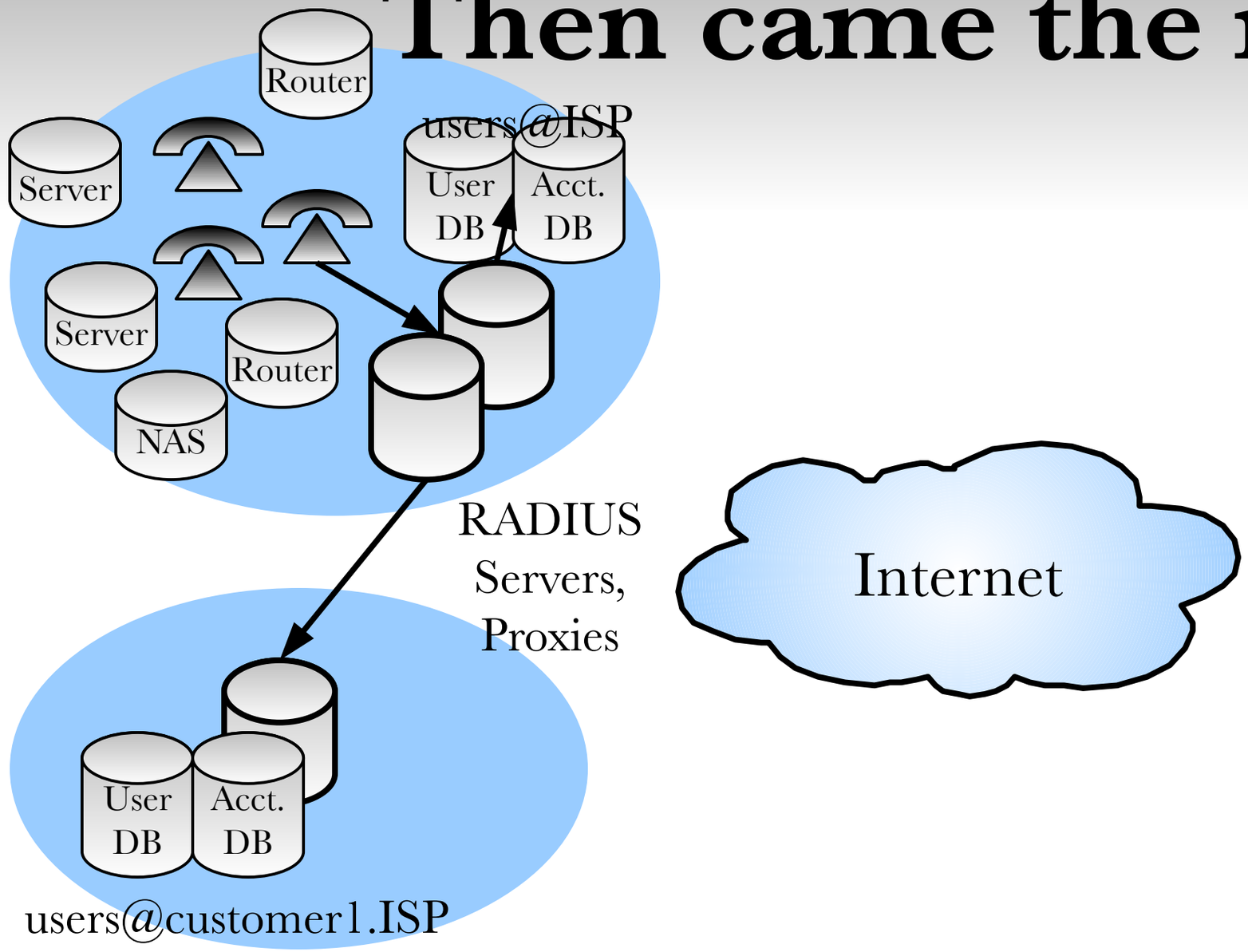
Then came the realms



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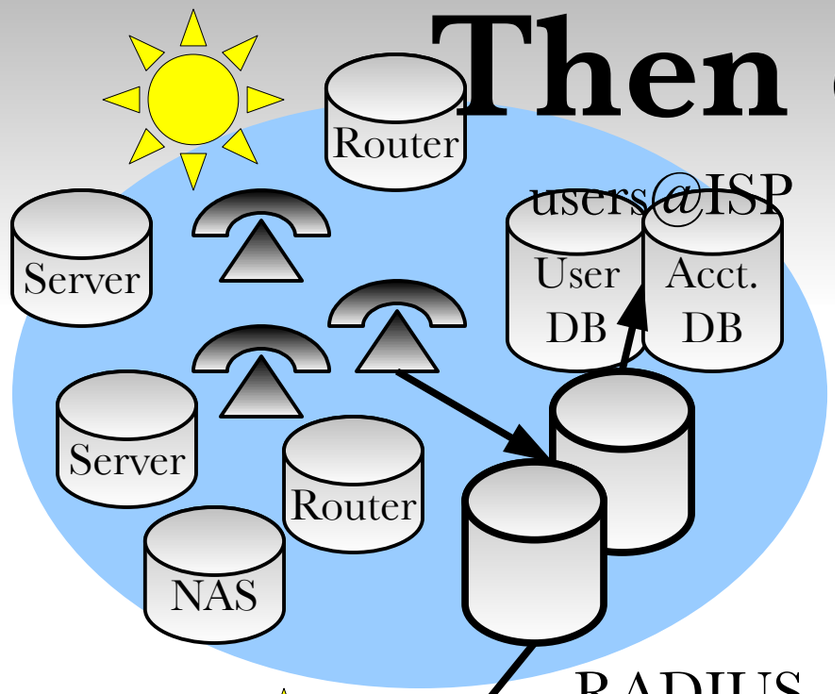
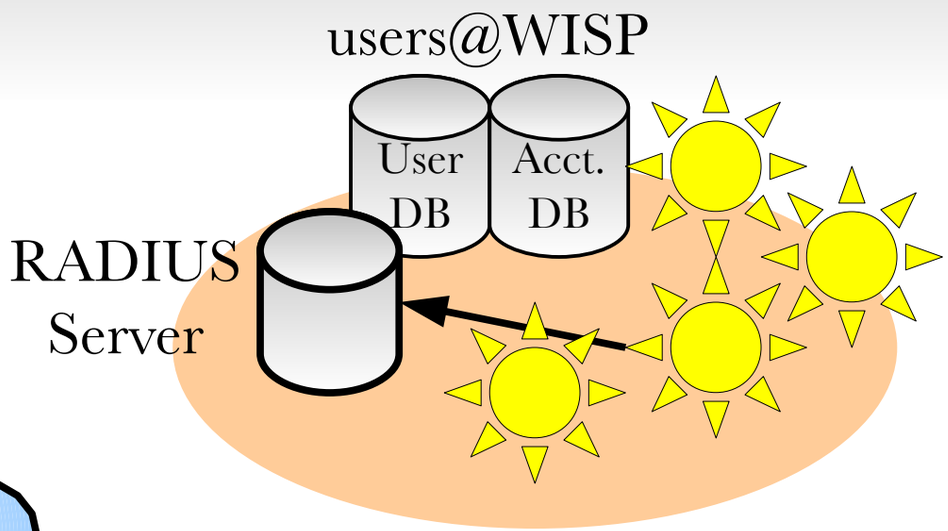
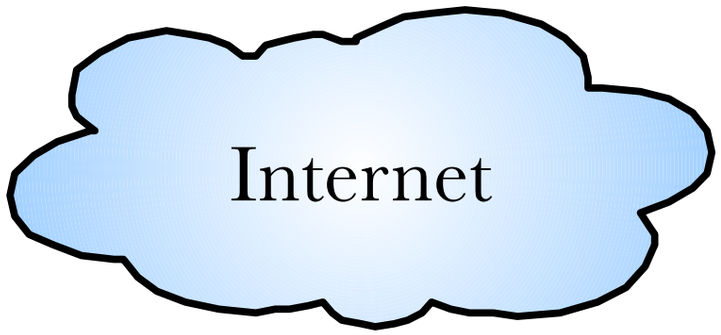
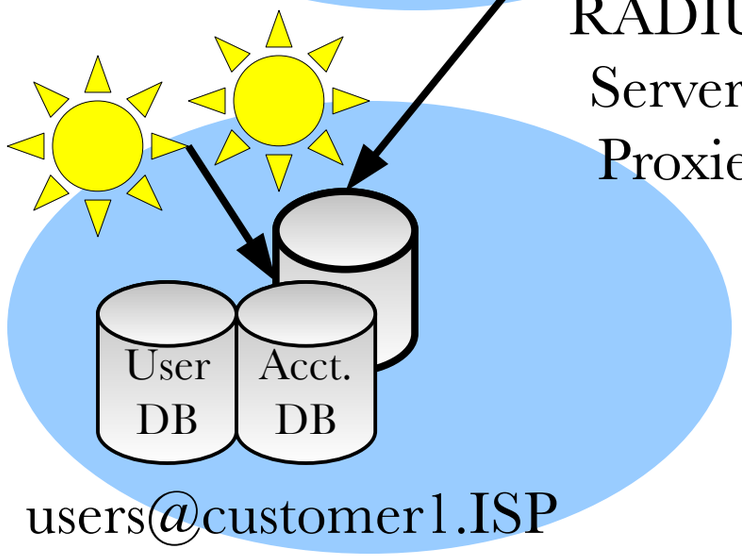
Then came the wireless





RADIUS Servers, Proxies





Wireless Internet Service Providers (WISPs)

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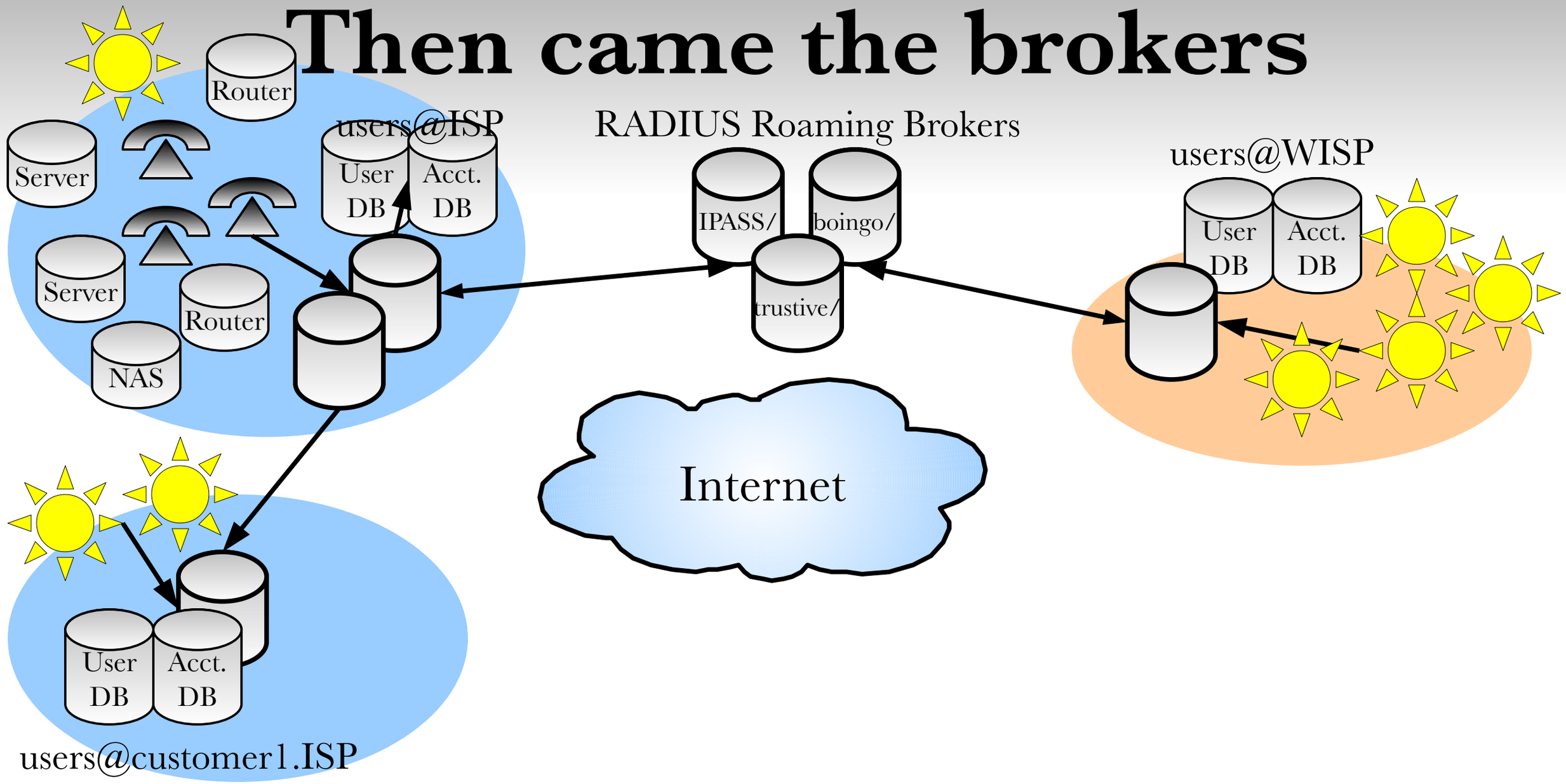
Then came the brokers



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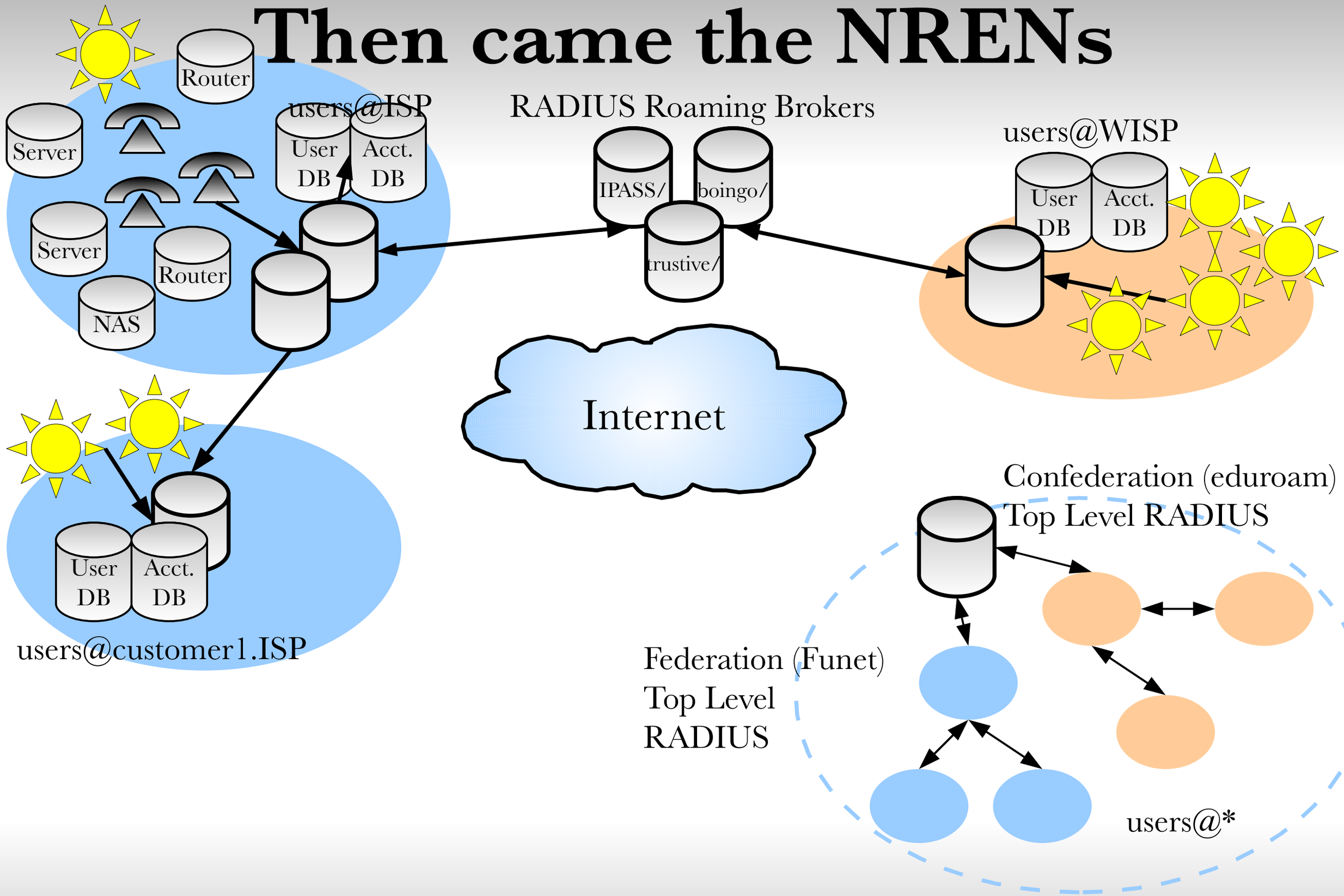
Then came the NRENs



National Research and Education Networks (NRENs)

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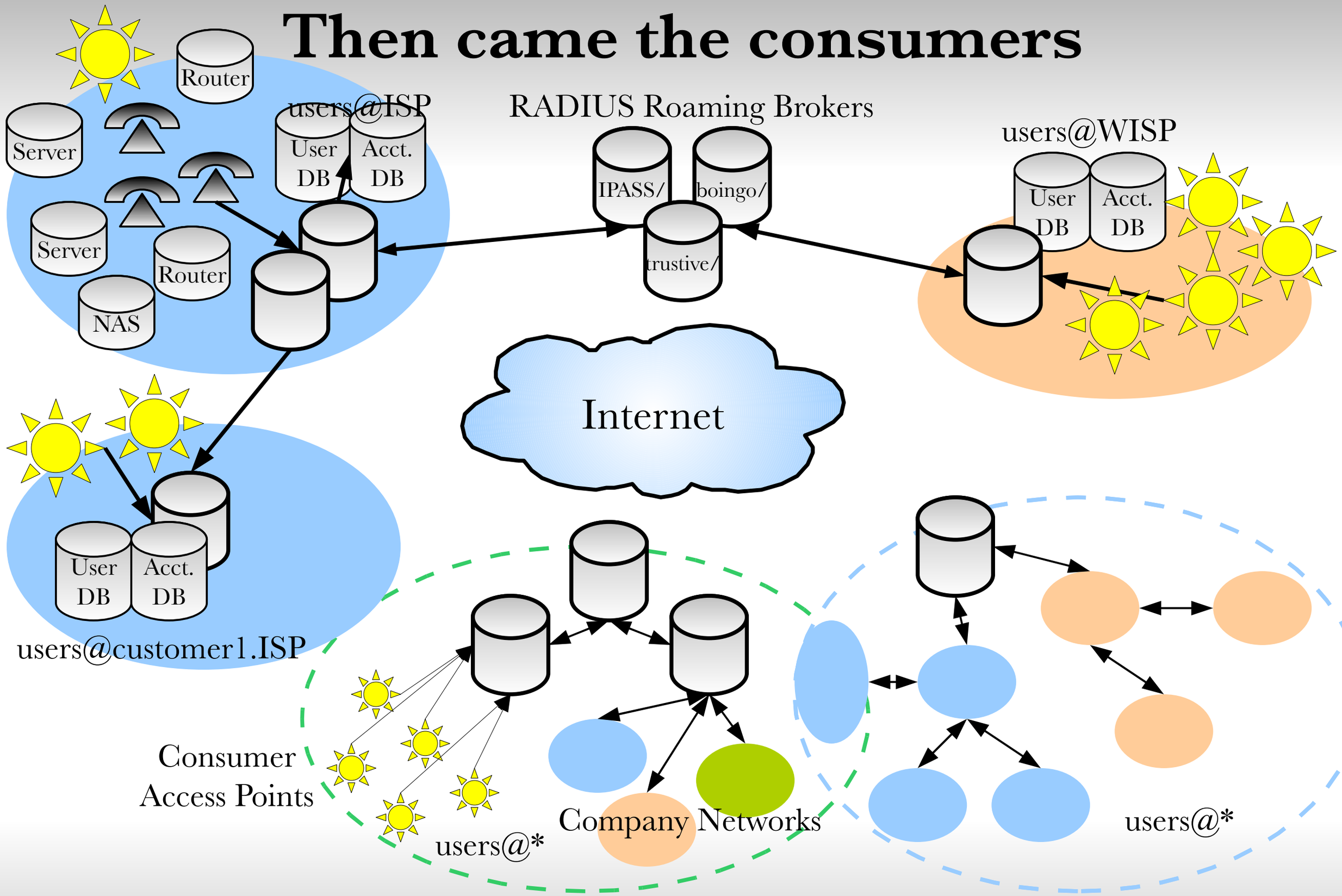
Then came the consumers



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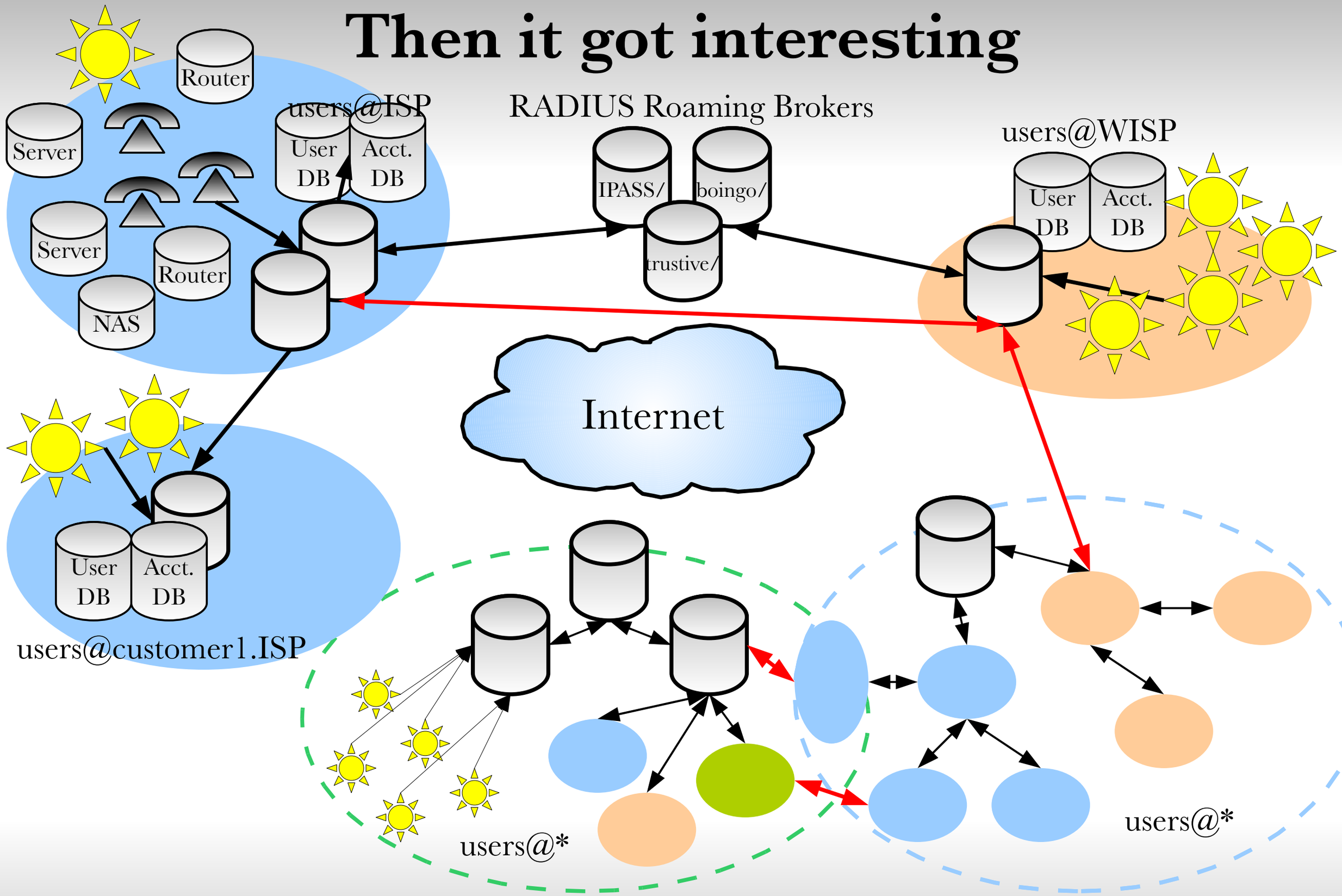
Then it got interesting



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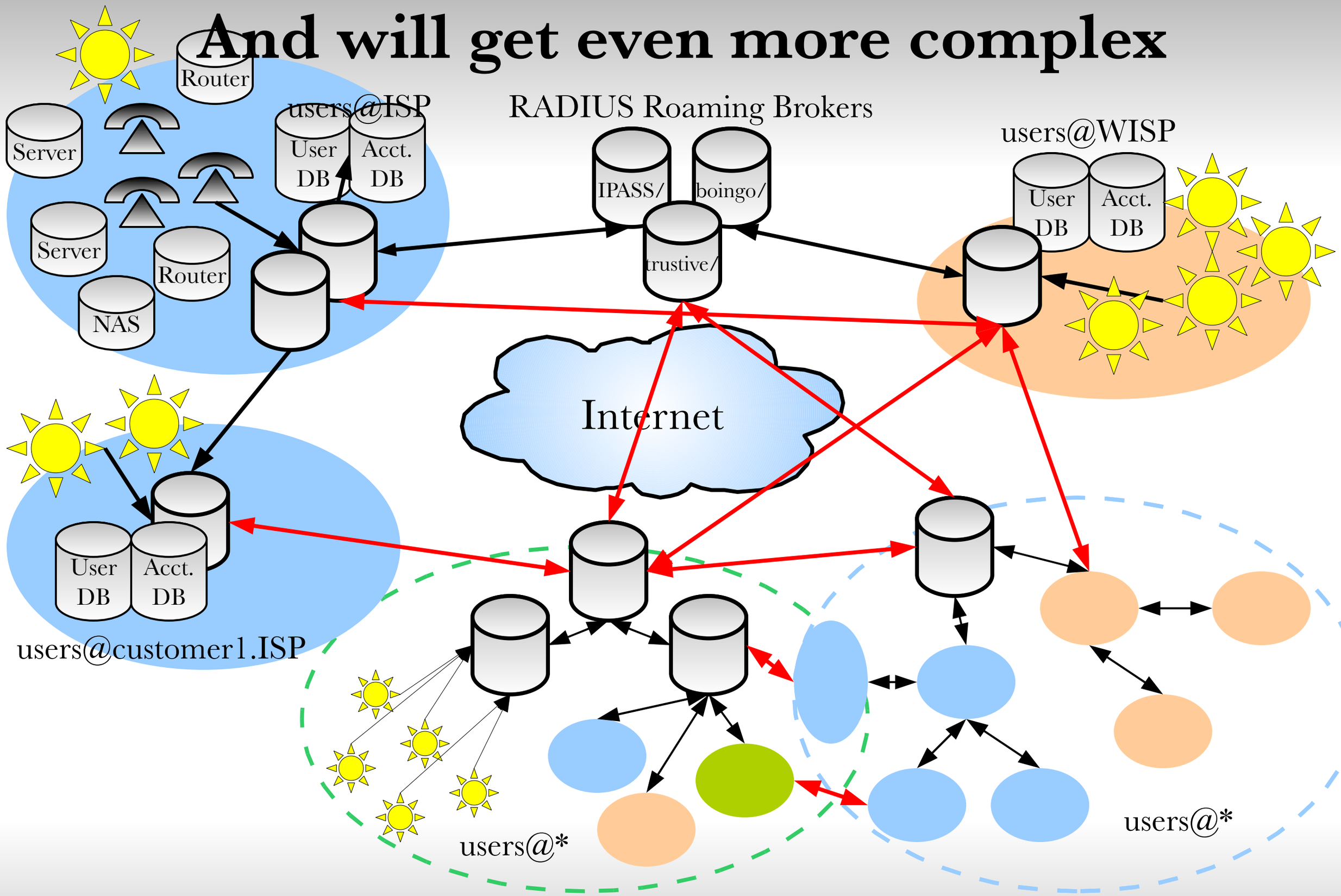
And will get even more complex



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… beginning to resemble routing

- Multiple default authentication routes
- Prefix/Realm advertisements
- Alternative authentication routes
  - With different costs and other metrics
- Preventing loops
- Securing authentication traffic and servers
- Protecting the privacy
- Sounds familiar, right?

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RADIUS protocol issues

- The original RADIUS has survived mainly because it has been quite easy to fix and extend with various RADIUS attributes.
- Even now when there has been a new authentication protocol called DIAMETER available, the work still continues to develop RADIUS further in RADIUS Extensions working group in IETF:
  - http://www.ietf.org/html.charters/radext-charter.html

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Securing authentication, protecting privacy, losing control?

- Developing EAP and EAP methods such as EAP-TLS, EAP-TTLS, PEAP made is possible to have a secured authentication tunnel from user terminal to home authentication server.
- The separate outer and inner identities such as anon@archred.com and user@archred.com made it possible to protect one's privacy, but needed something else to be developed as a unique identity.
- Chargeable User Identity was developed as a solution:
  - http://www.ietf.org/rfc/rfc4372.txt

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Ensuring reliable message delivery

- The current RADIUS protocol is UDP traffic => So far the tunnelling has been the only way to ensure reliable message delivery and roaming connections.

- There exists drafts to try to solve this:
  - RADIUS over TCP:
    - http://www.ietf.org/internet-drafts/draft-ietf-radext-tcp-transport-02.txt
  - TLS encryption for RADIUS over TCP (RadSec):
    - http://www.ietf.org/internet-drafts/draft-ietf-radext-radsec-03.txt

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From fixed RADIUS hierarchy to peer-to-peer architecture

- Solving the multiple roaming agreements and alternative route issues still needs work.
- Using DNS for discovering authentication realms is common in all proposals trying to solve the multiple roaming agreements.
- The authentication connections are done by demand dynamically from peer to peer instead of having a fixed hierarchy.
- The selection of roaming agreement and the validation of authentication servers is done with the certificates.
- The DNS discovery is actively developed within the RadSec proposal.

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Alternative authentication routes: costs and metrics

- Some work for specifying RADIUS attributes for these is rumored to be done, but could not get a confirmation at least from the RADIUS Extensions group?
- Work with DIAMETER/RADIUS is also done in 3GPP working groups, but their work is not covered in this presentation.
- Development of Peer-to-Peer RADIUS roaming might make these issues irrelevant?

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Summary

- RADIUS, just like the Internet, is not so simple anymore than it used to be.
- But just like the Internet, RADIUS still scales, evolves and new solutions and technology are build utilising it.
- New technologies like DIAMETER may gain ground, but RADIUS is likely to be around at the same time.
- Combining and (inter)connecting Internet and Telco driven authentication as well as community networks will drive the development and adoption of RADIUS and DIAMETER forward.

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Thank you. Any Questions?

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http://www.archred.com/

Karri Huhtanen

Firstname . Surname @ archred.com