Building a One-Time-Password Token Infrastructure

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LIGO Laboratory

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Distributed

Multi-Institution

International

LIGO

Kerberos

Shibboleth

Grouper

LIGO

Open Data

Time Critical

No Do-Overs

Remote Access

Single/Common sign-on

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Credential Theft

Separate Credential

Non-Replayable

Not for everything

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One Time Passwords

What does(n't) OTP solve?

Time Based

Sequence Based

Challenge-Response

One Time Pad

Something you Have

What do(n’t) tokens solve?

Delivery

Rolf

Synchronization

Overhead

Integration

Failures

One token to rule them all

Physical device

Trust No-one

Distributed, Fault tolerant

Open

Cheap

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Custom Authentication Server

PAM

Yubikey

Kerberos

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Why?

Ownership

Trust

Capabilities

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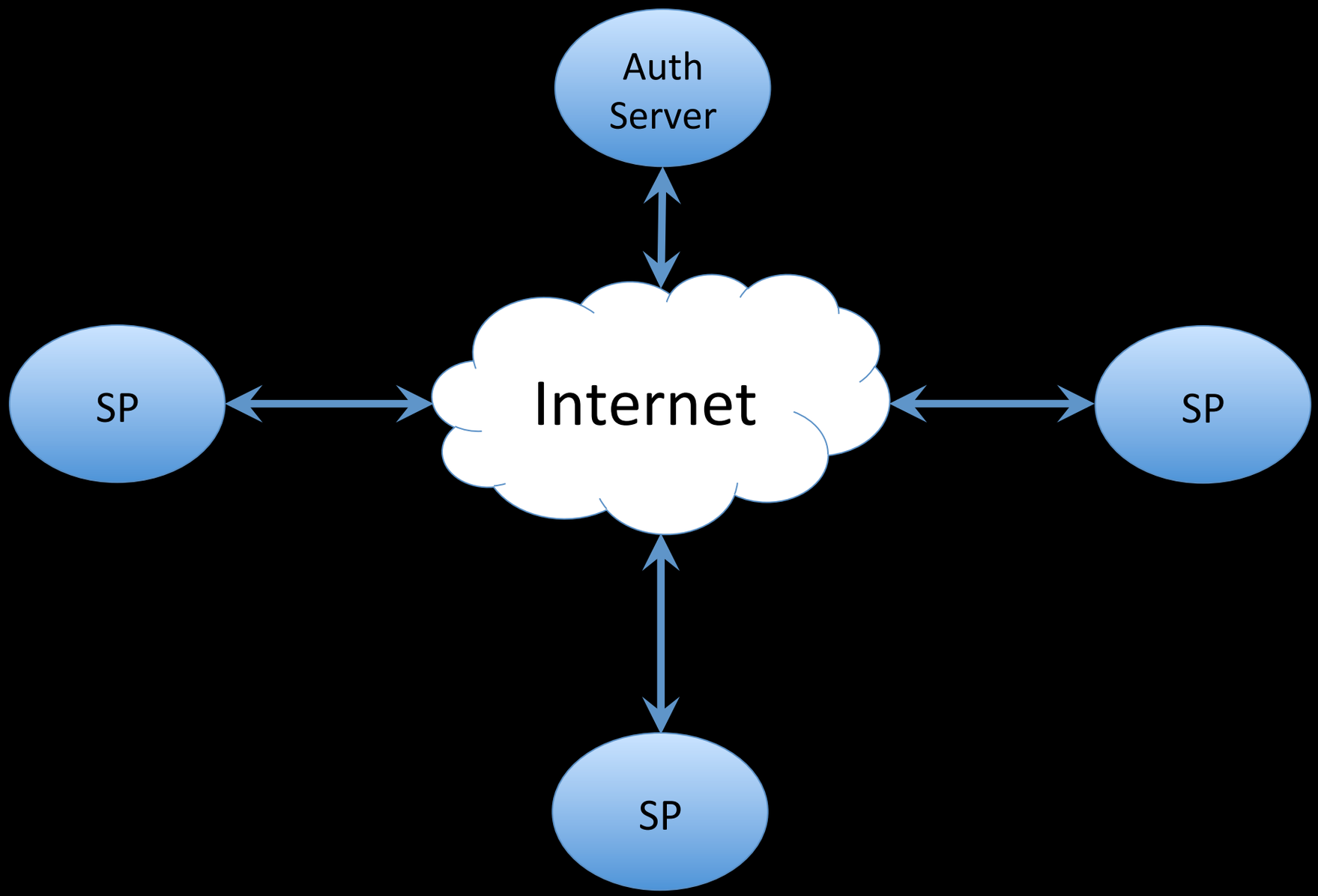
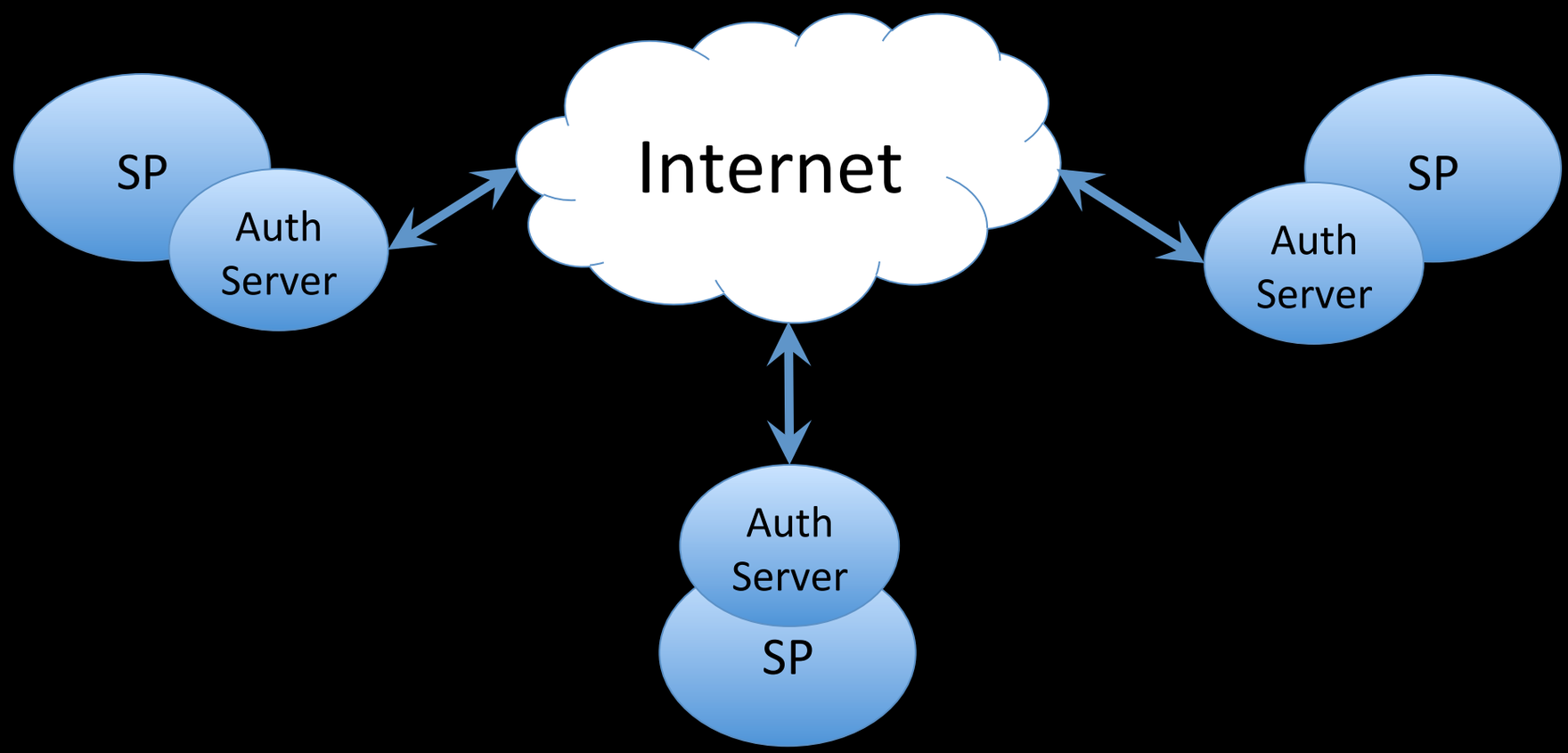
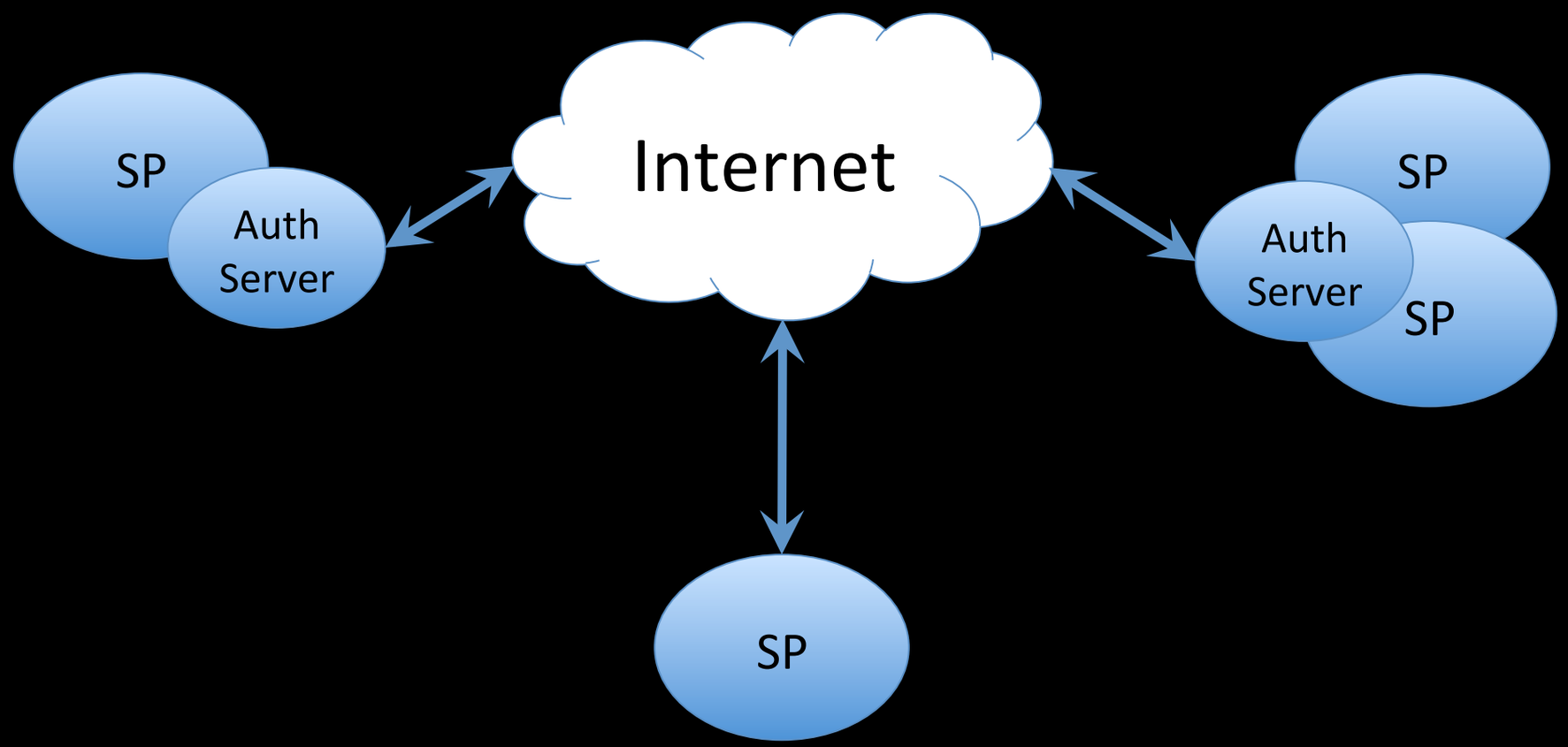
Architectures



SP = Service Provider


SP
Auth Server
Internet
SP
Auth Server
Auth Server
SP


SP
Auth
Server
Internet
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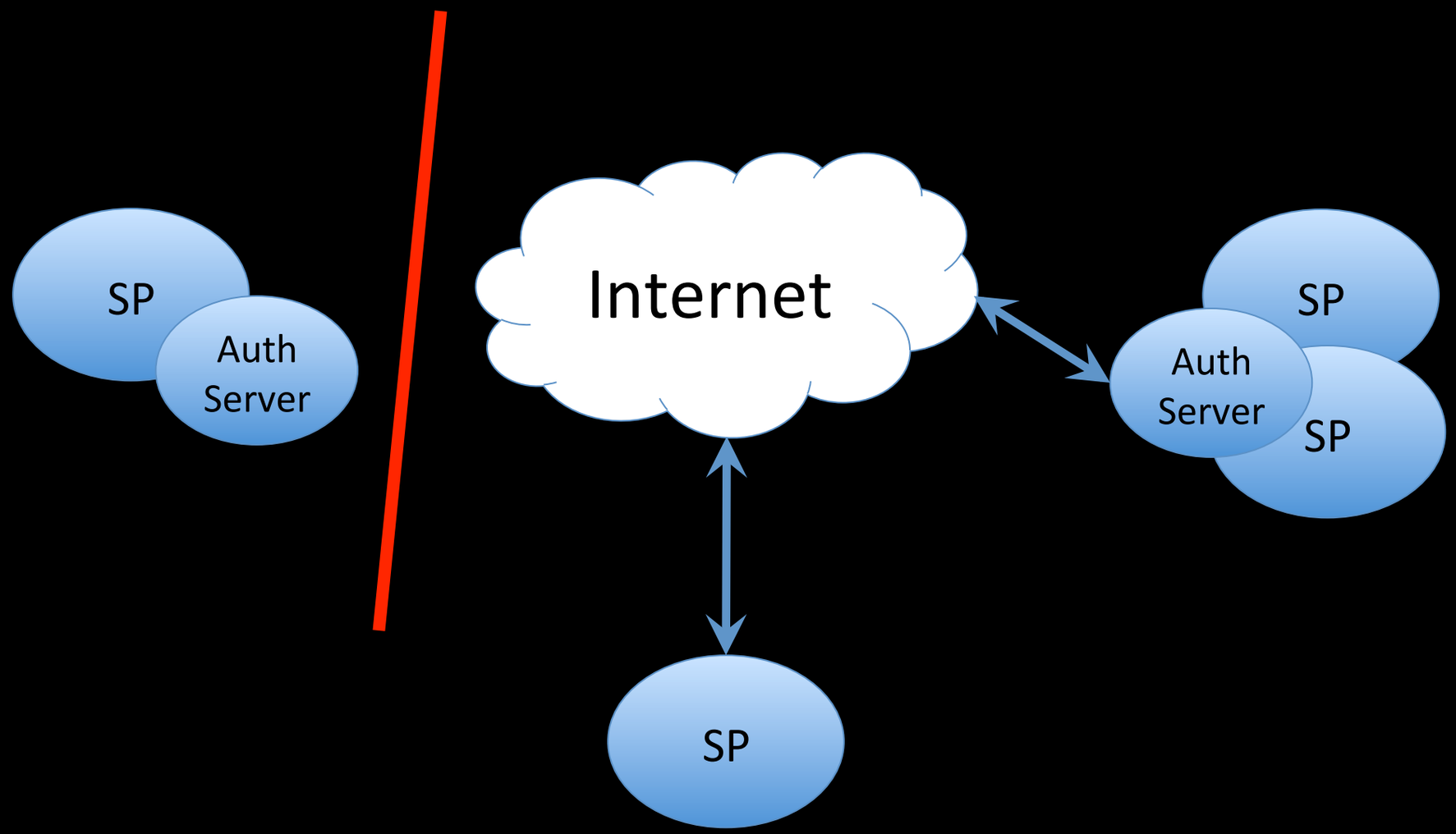
SP
Auth
Server
Internet
SP
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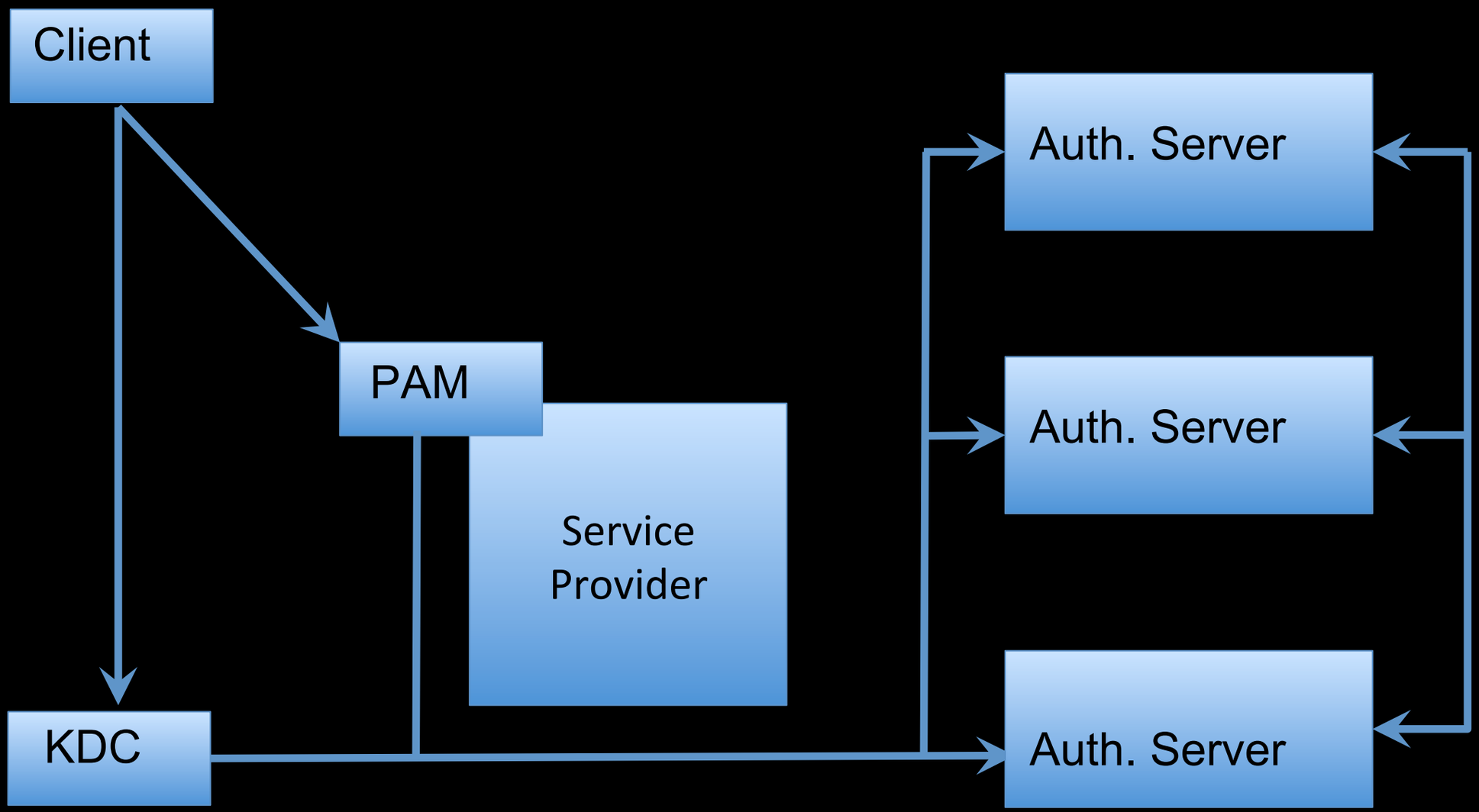
Server
SP
SP

Architecture



Replication and Mitigating Replay Attacks

Replication takes Time

Replicate Data w/o global locks

Centralized yet Distributed

No Secrets on Endpoints

There can be only one

Modular, Abstracted

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Provisioning Users

Make it simple

Make it safe

Supporting Users

Any auth scheme is a hinderance

Just replace the token

Experiences / Problems

It Works

Tokens get out of sync

When good tokens go bad

Local Account Issues

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Kerberos

We like SSO

Cannot afford to support all the client systems

Cannot wait for the OTP extensions to reach end users

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Hijack encrypted timestamp

All kinits support this

No custom client SW required

Questions?