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# Identity Management:
## *The authentic & authoritative guide for the modern enterprise*

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# Goals of the Presentation

- Introduce Identity Management problem space
- Give you an overview of the identity management components in the Red Hat portfolio
- Provide examples of some real-world use cases that can be solved with the identity management capabilities Red Hat offers
- Show that these solutions are cost effective

# Identity Management Problem Space

# What is Identity Management?

- What does this mean to you?
- What issues are you running into in this area?

# Wikipedia as the “authoritative source” for definitions:

## *Identity Management - (noun)*

“Identity management (IdM) describes the management of individual principals, their authentication, authorization, and privileges within or across system and enterprise boundaries with the goal of increasing security and productivity while decreasing cost, downtime and repetitive tasks.”

*Wikipedia*

# Identity Management Problem Space

- **Identities**
  - Where are my users stored? What properties do they have? How is this data made available to systems and applications?
- **Authentication**
  - What credentials do my users use to authenticate? Passwords? Smart Cards? Special devices? Is there SSO? How can the same user access file stores and web applications without requiring re-authentication?
- **Access control**
  - Which users have access to which systems, services, applications? What commands can they run on those systems? What SELinux context is a user is mapped to?
- **Policies**
  - What is the strength of the password? What are the automount rules? What are Kerberos ticket policies?

# Overview of the Identity Management Components

# Components of the Portfolio

- Identity Management in Red Hat Enterprise Linux (IdM)
- SSSD
- Certmonger
- Ipsilon IdP
- Apache modules

# Identity Management

- Domain controller for Linux/UNIX environments
- Combines LDAP, Kerberos, DNS and certificate management capabilities
- Provides centralized authentication, authorization and identity information for Linux/UNIX infrastructure
- Enables centralized policy and privilege escalation management
- Integrates with Active Directory on the server-to-server level

# SSDD:

## *(The System Security Services Daemon)*

- Client-side component
- Part of Red Hat Enterprise Linux and many other Linux distributions
- Allows connecting a system to the identity and authentication source of your choice
- Caches identity and policy information for offline use
- Capable of connecting to different sources of identity data at the same time

# Certmonger

- Client side component
- Connects to central Certificate Server and requests certificates
- Tracks and auto renews the certificates it is tracking

# Ipsilon IdP

- Identity Provider implementation
- Allows federation between different applications using SAML based SSO

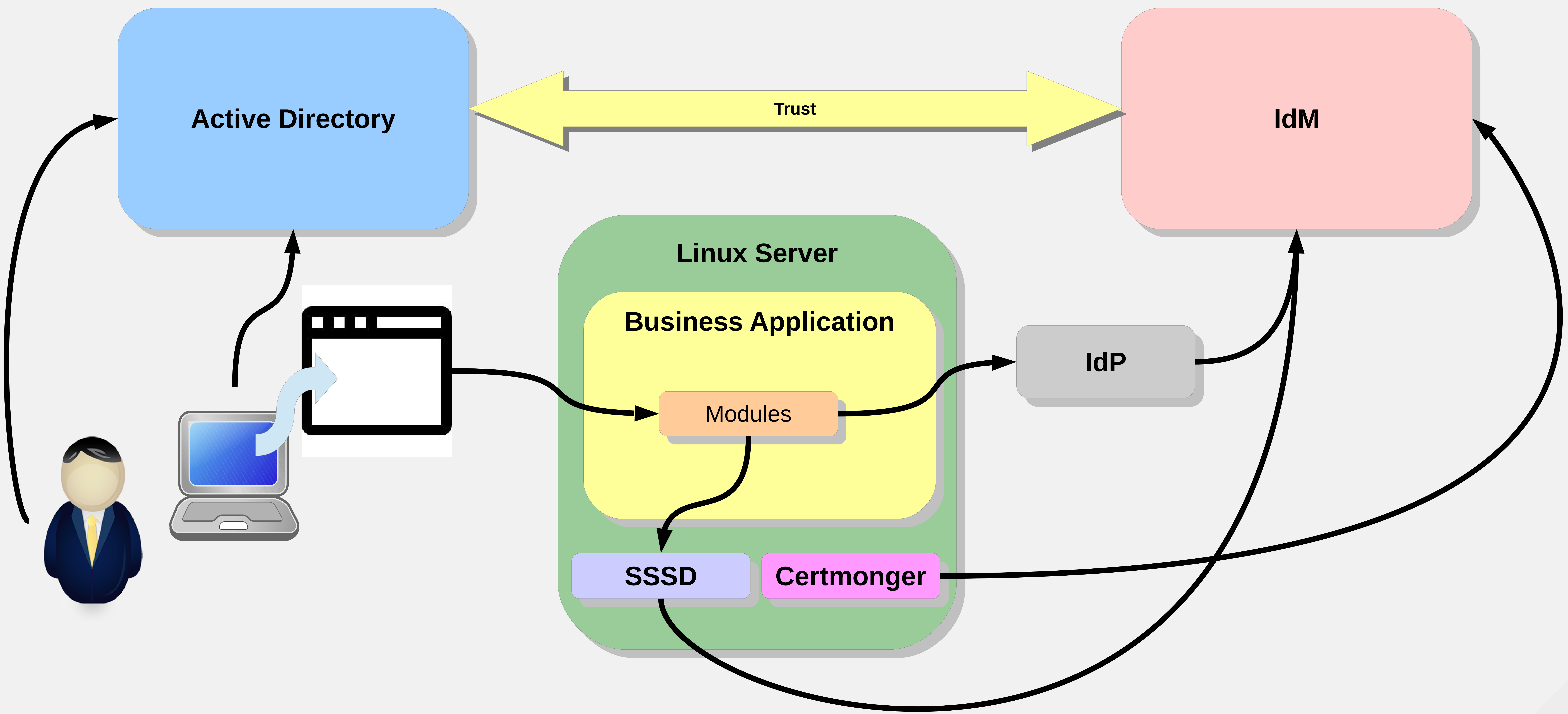
# Apache Modules

- Modules that can be integrated with Apache server

- Modules that support forms-based, Kerberos or SAML authentication

- Authorization and identity data lookups are also possible using corresponding modules

# Example Architecture



# Solving Real World Identity Management Challenges

# Use Cases and Challenges

- **How can I provide centralized authentication?**
- Can I define access control to hosts without copying configuration files?
- Can I manage SSH keys for users and hosts?
- Can I provide centralized SUDO, automount, SELinux user mappings?
- Is there a cost effective solution that provides strong authentication using OTP?
- Can I provide a smooth SSO experience for my users inside the enterprise?
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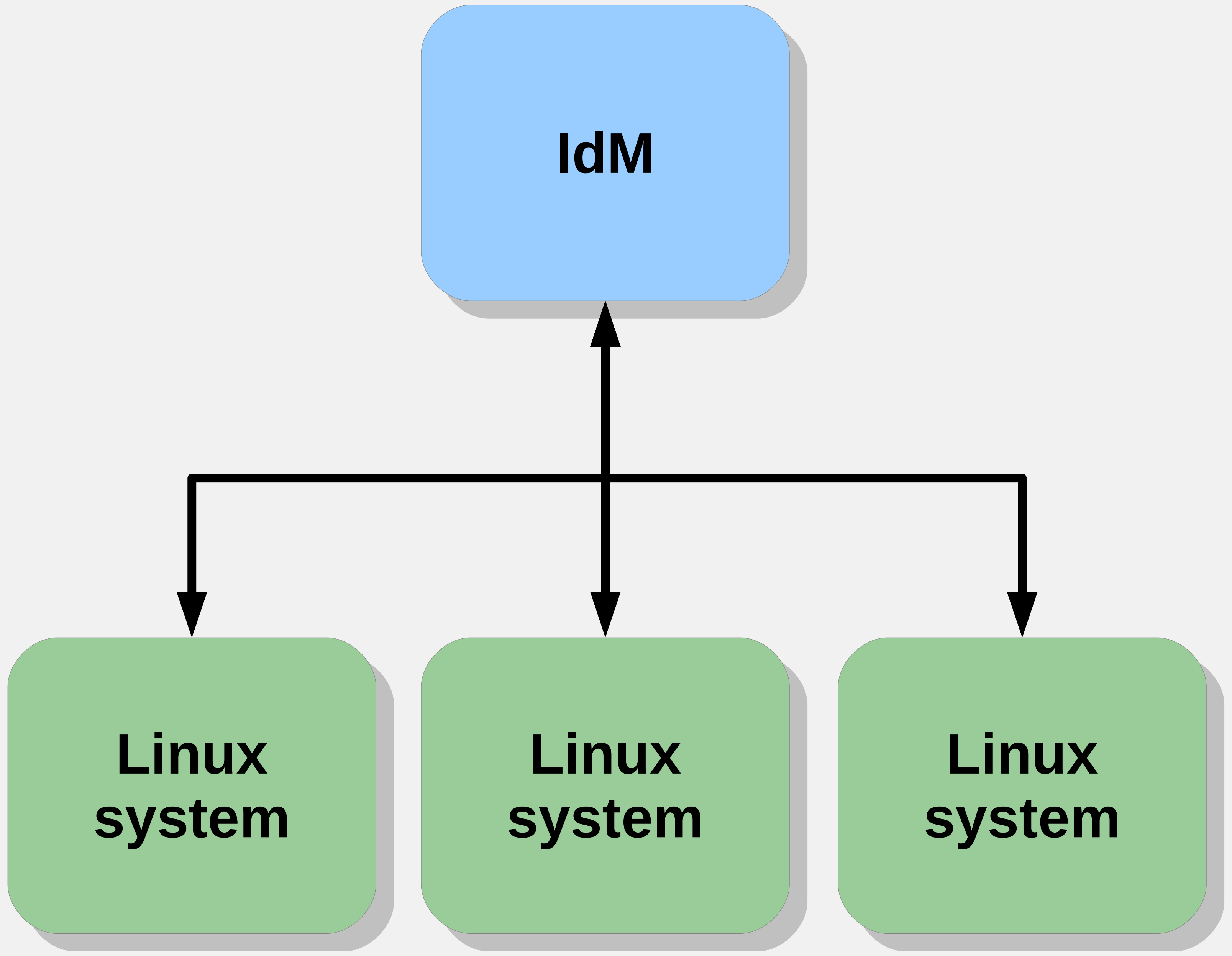
# Centralized Authentication



**Steps:**

- Consolidate your user accounts
- Load your user data into a IdM
- Connect you Linux/UNIX systems to IdM
  - ipa-client-install

**Why would I use IdM?**

- Different authentication methods:
  - LDAP, Kerberos, OTP, Certificates
- Integrated solution
  - Easy to install and manage
- Integrates with AD
- Has a lot of other valuable capabilities

# Use Cases and Challenges

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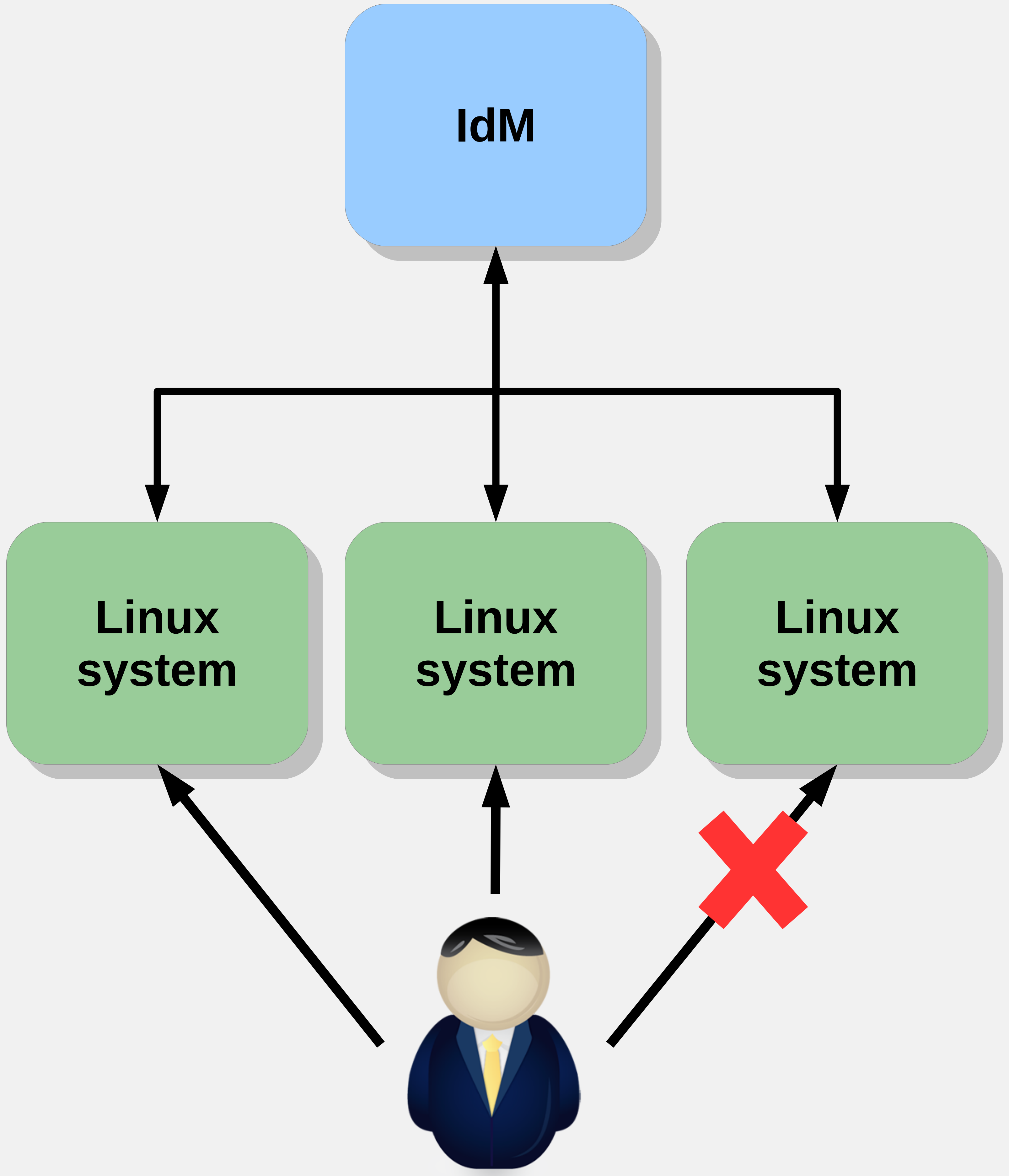
# Host Based Access Control



- Which users or group of users can access
- Which hosts or groups of hosts
- Using which login services console, ssh, sudo, ftp, sftp, etc.

- You define rules centrally
- Rules are enforced on the client
- Rules are cached
- There is a test tool to help you

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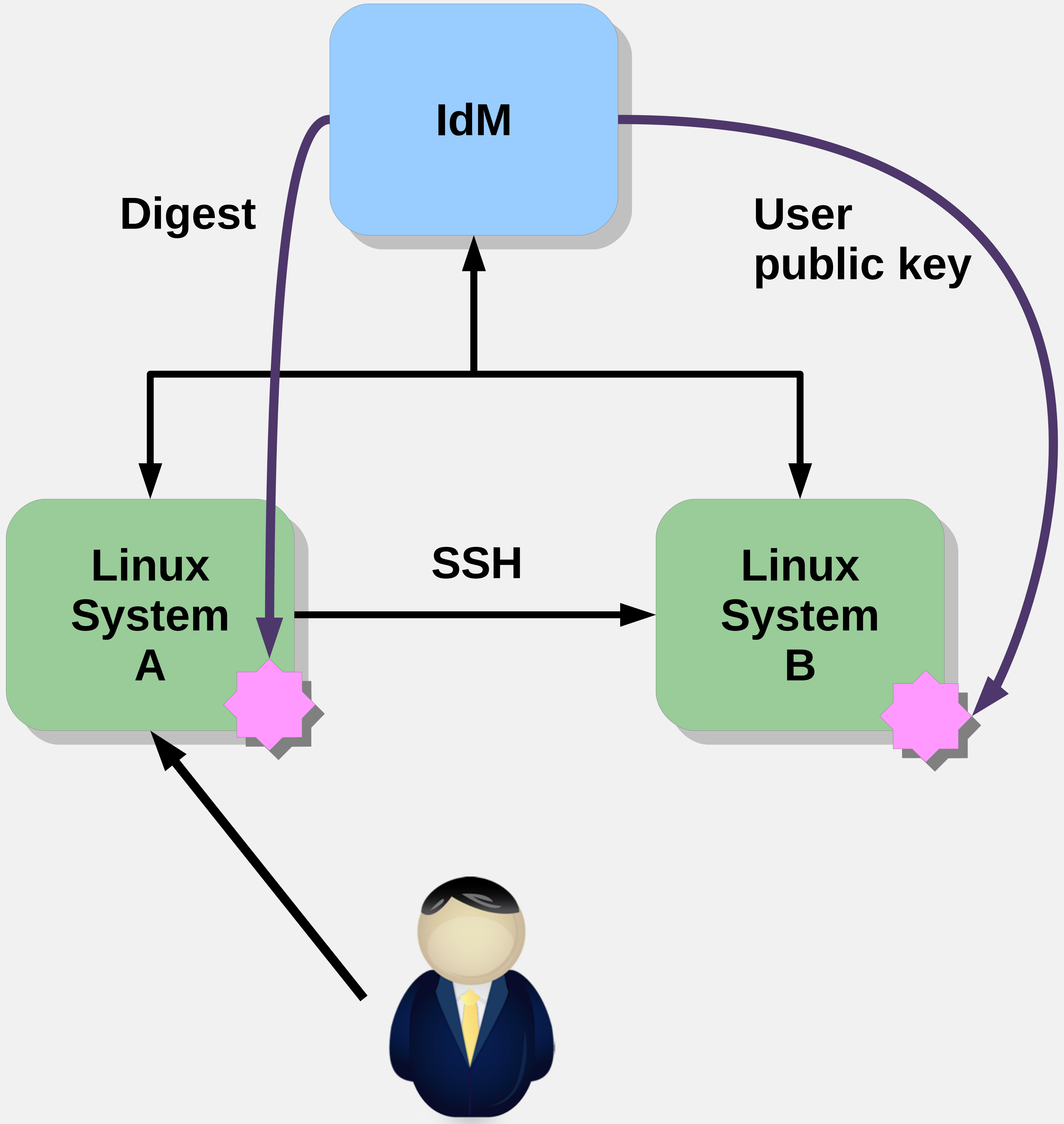
# SSH Key Management



- Host public keys uploaded at the client installation time
- User can upload his public key to IdM manually
- When user SSHs from a system A the public key of to the target system B is delivered to system A (no need to validate digest)
- User public key is automatically delivered to system B

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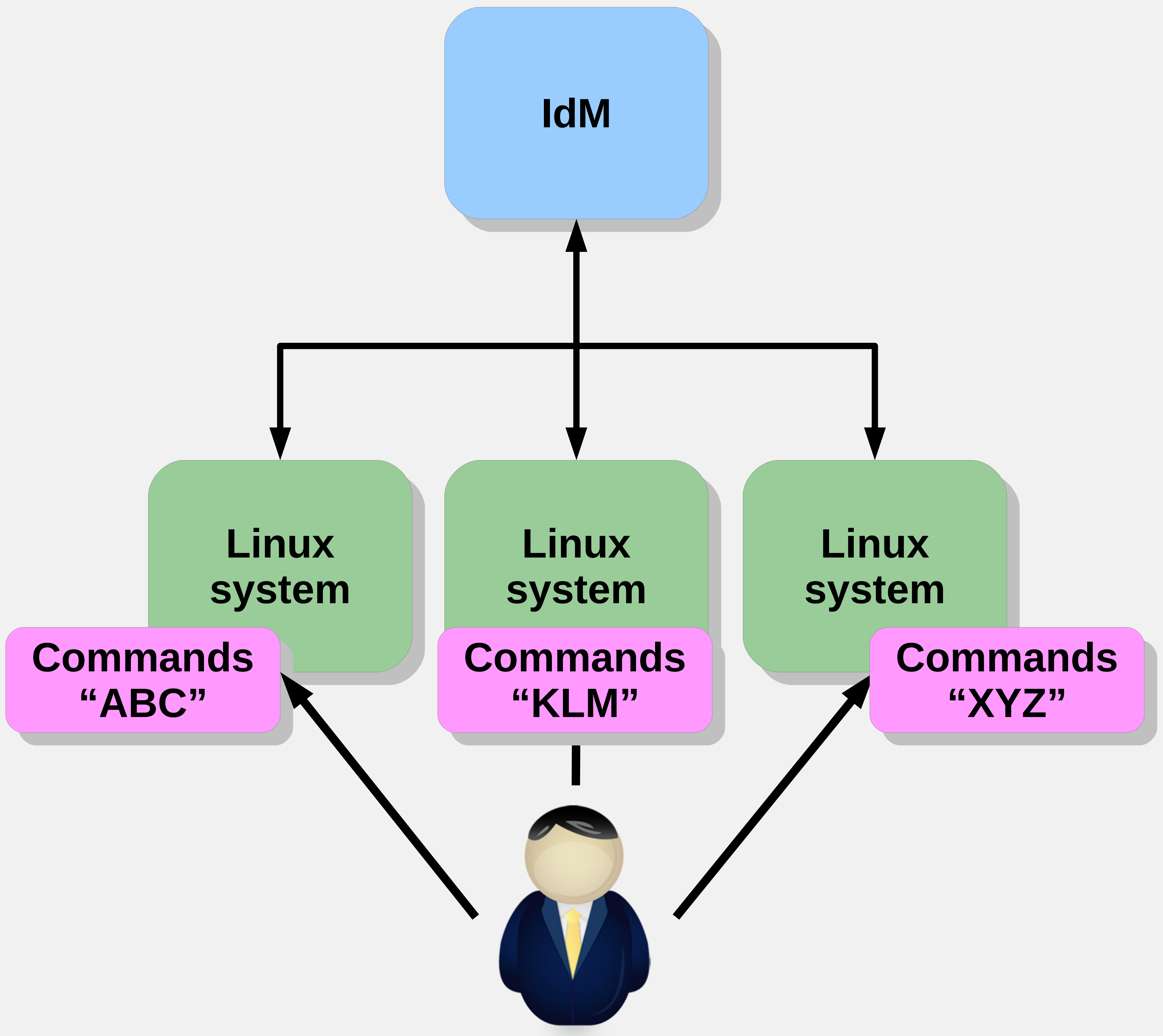
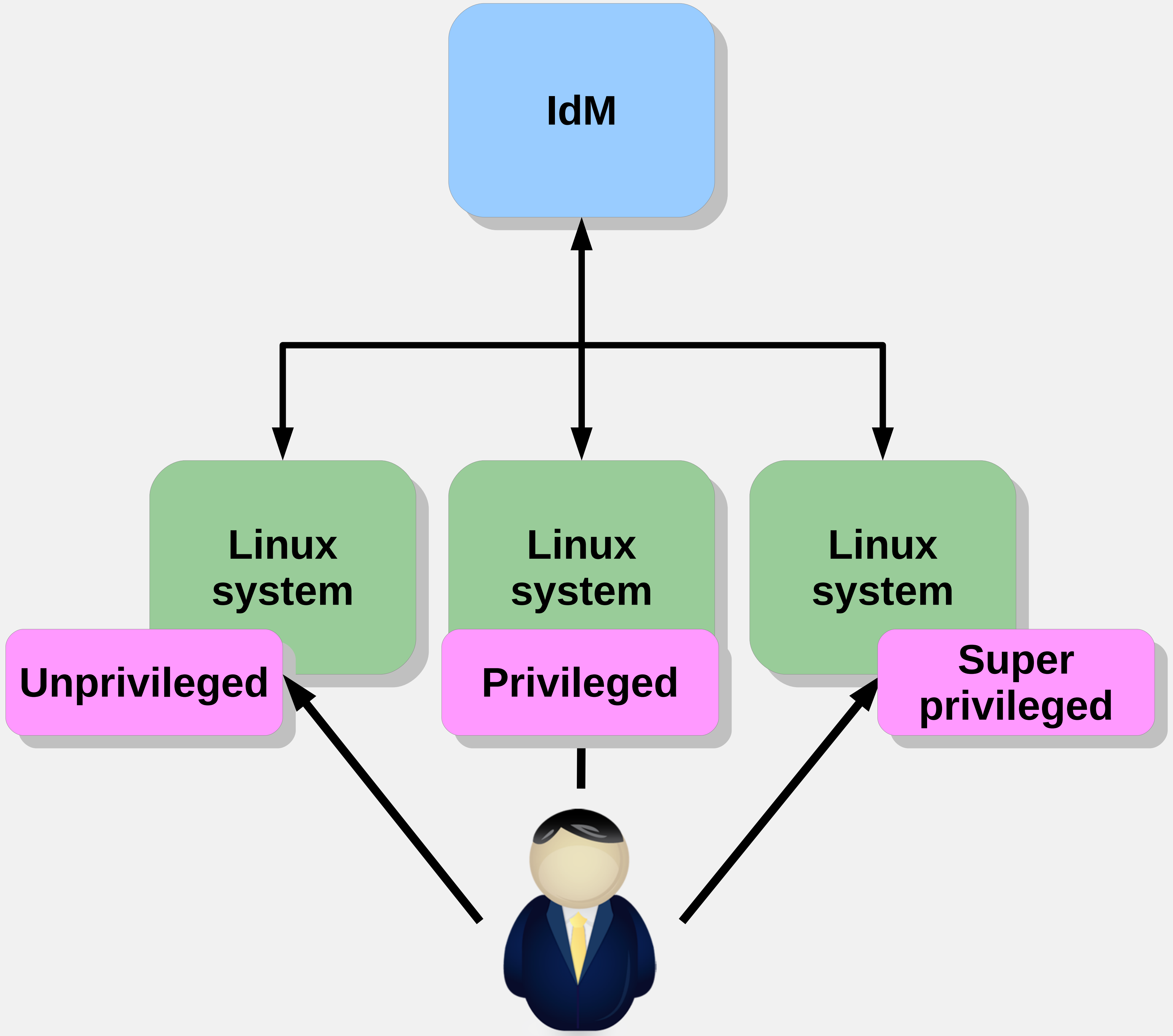
# SUDO Integration



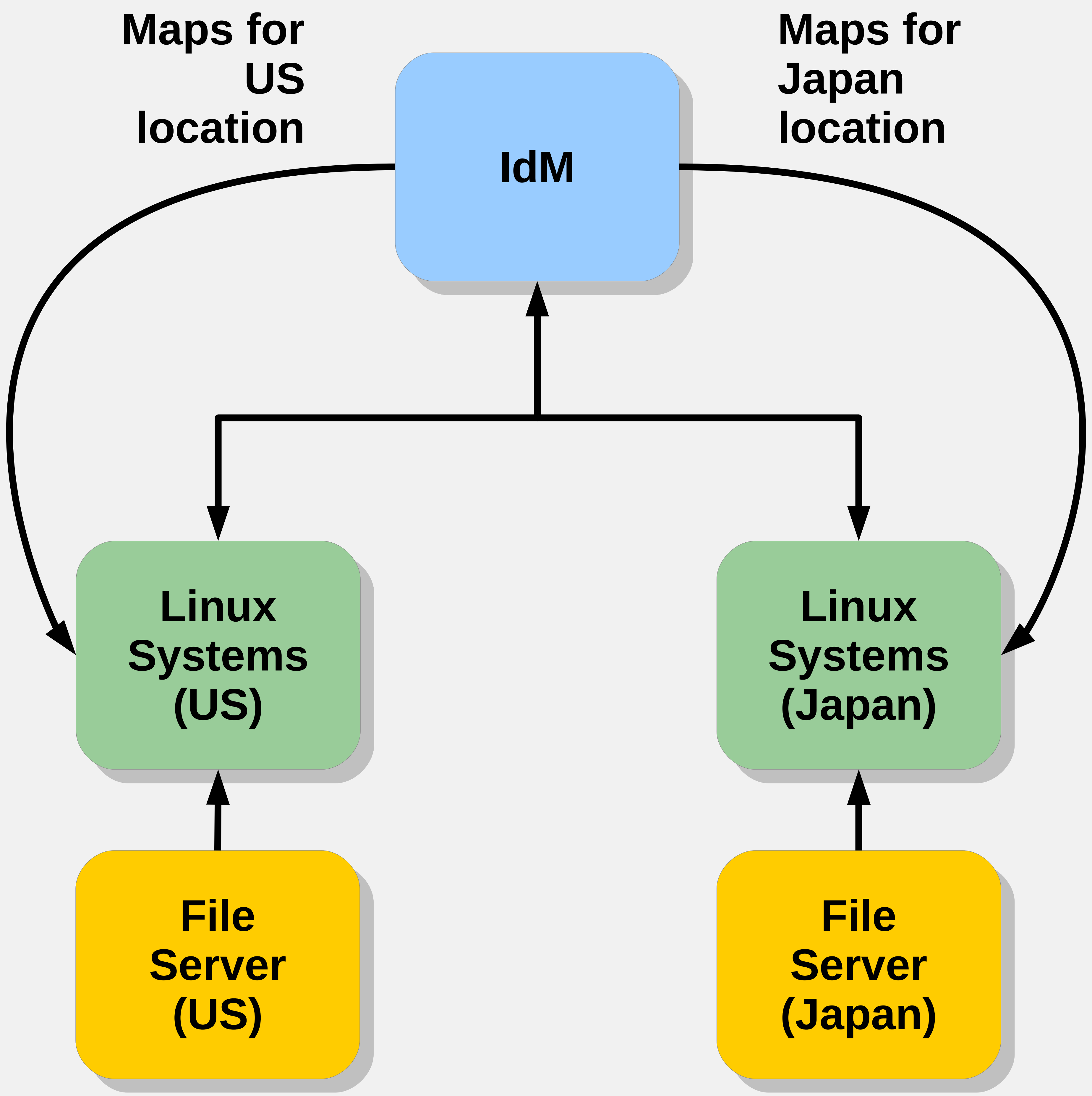
- Centrally define commands and groups of commands
- Define which groups of users can run these commands or groups of commands on which hosts or groups of hosts
- Rules are enforced on client
- Rules are cached
- Capability is integrated into the sudo utility

# SELinux User Mapping



- Mappings can be defined centrally
- Allow different users on different systems have different SELinux context
- Default SELinux labels are available in IPA configuration
- Mappings are enforced on the client
- Mappings are cached

# Automount



- Define direct or indirect maps
- Associate maps with a particular location
- Configure clients to pull data from that location (part of the LDAP tree)

- Maps are defined centrally
- Maps are applied on the client
- Maps are cached
- Maps are integrated with autofs

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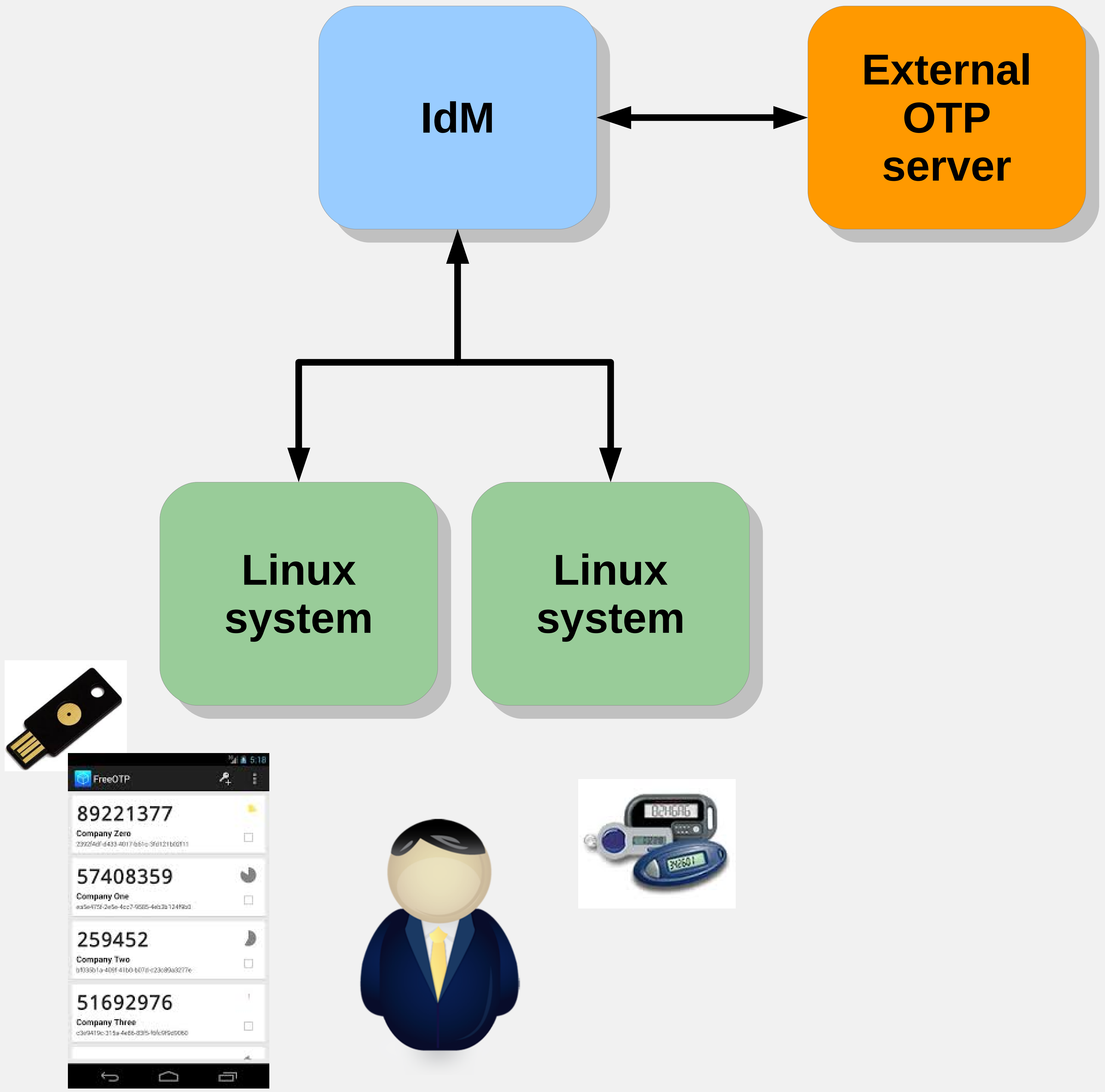
# Two Factor Authentication



- Native 2FA
  - Yubikey, FreeOTP, Google authenticator
  - HOTP/TOTP compatible
  - Over LDAP or Kerberos
- Proxied over RADIUS
  - Any third party that has RADIUS support
  - Kerberos only
- Easy migration

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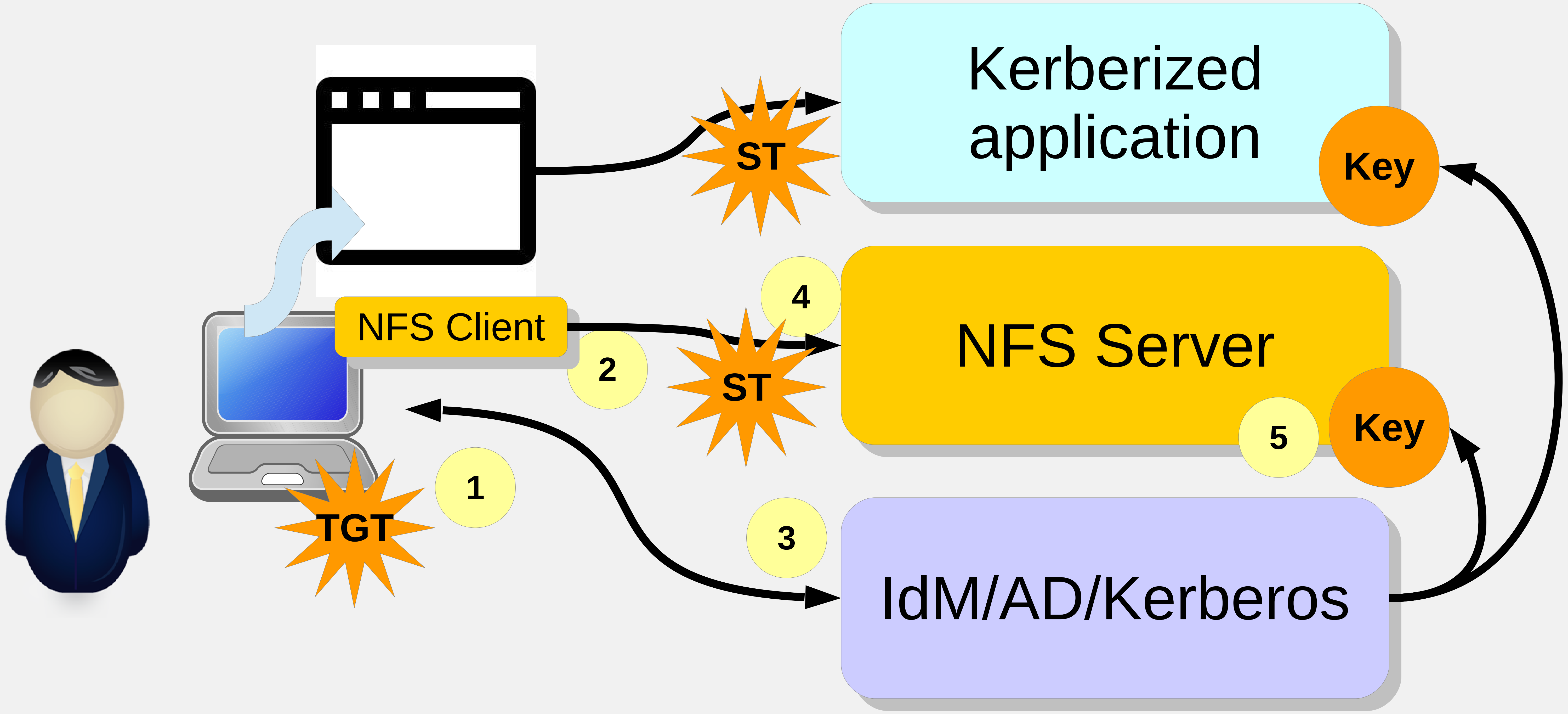
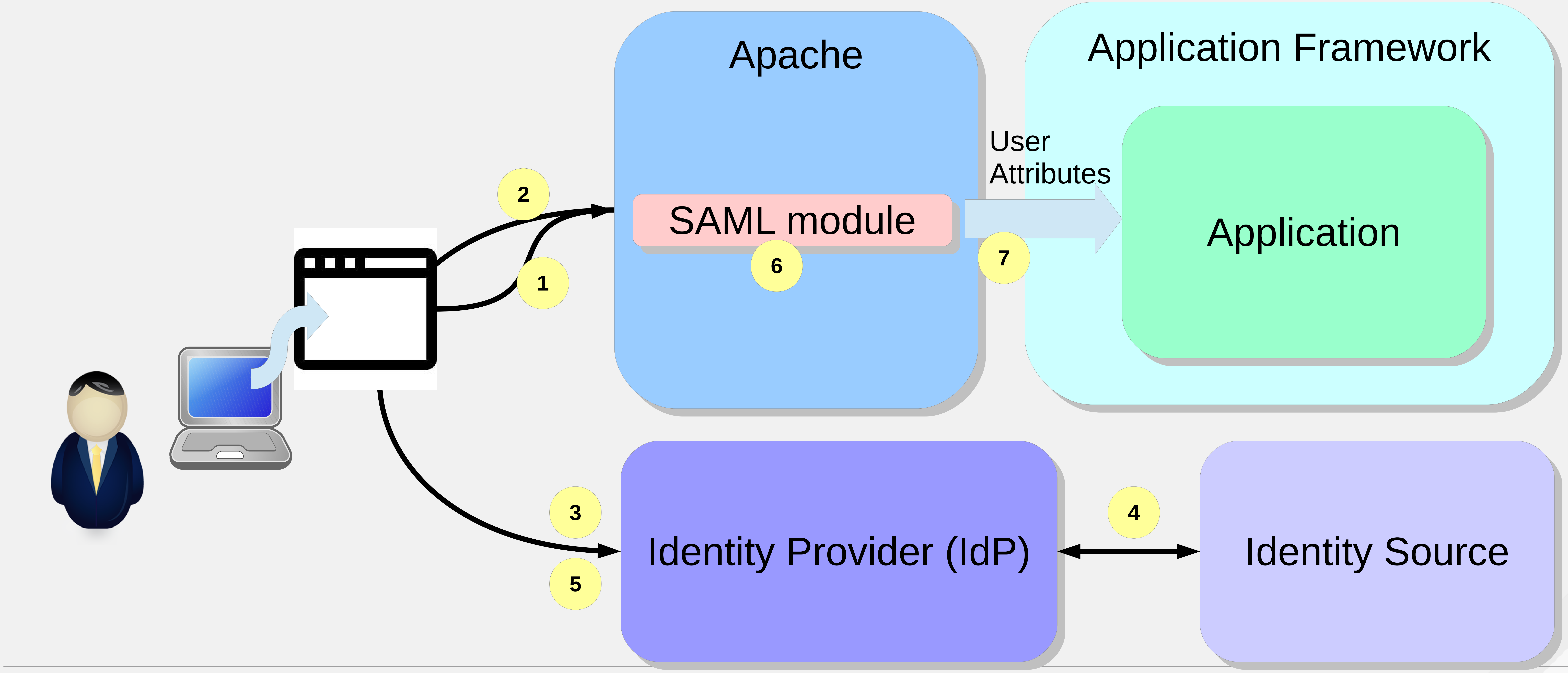
# Kerberos Based SSO



# Kerberos SSO Flow

- User logs into the system that is connected to a Kerberos server
  - It can be: Kerberos KDC, Active Directory or IdM
- User authenticates (1) and receives a ticket granting ticket (TGT) from Kerberos server
- User accesses a resource (2), for example NFS client
- Kerberos library will request a service ticket from KDC on behalf of the user (3)
- Ticket is presented to the service, for example NFS server (4)
- Server or service decrypts using using its Kerberos key
- Keys are distributed at the configuration time, IdM provides a command to get the Kerberos keys for the client systems

# SAML Based SSO



# SAML Flow

1. User starts browser and navigates to a resource or application
2. SAML component checks the presence of the assertion and redirects to IdP
3. IdP prompts user for authentication  methods it supports
4. IdP uses some identity source to perform the authentication
5. IdP creates a SAML assertion and redirects browser back to the resource
6. SAML component checks the assertion and extracts user data from it
7. Data is passed to the application – user is authenticated

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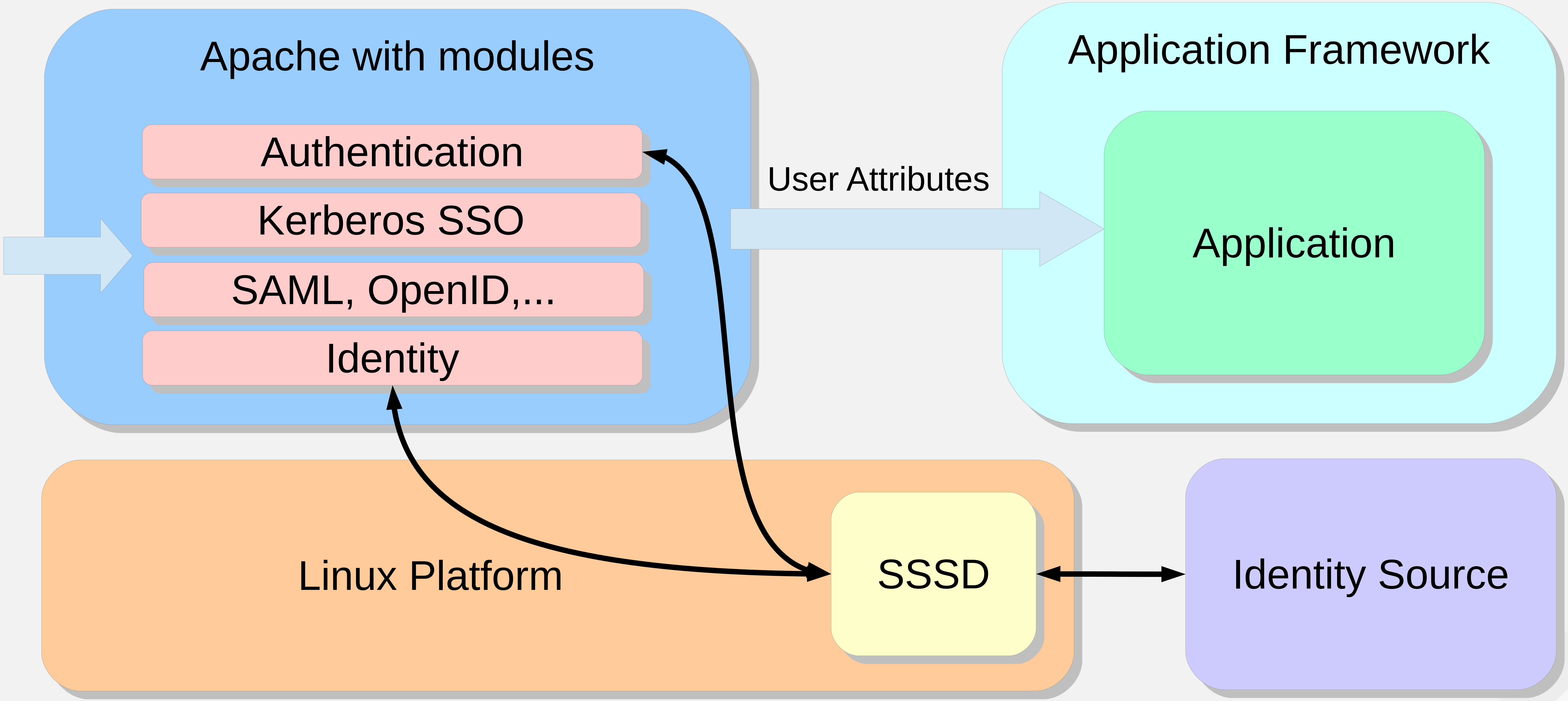
# Application Integration



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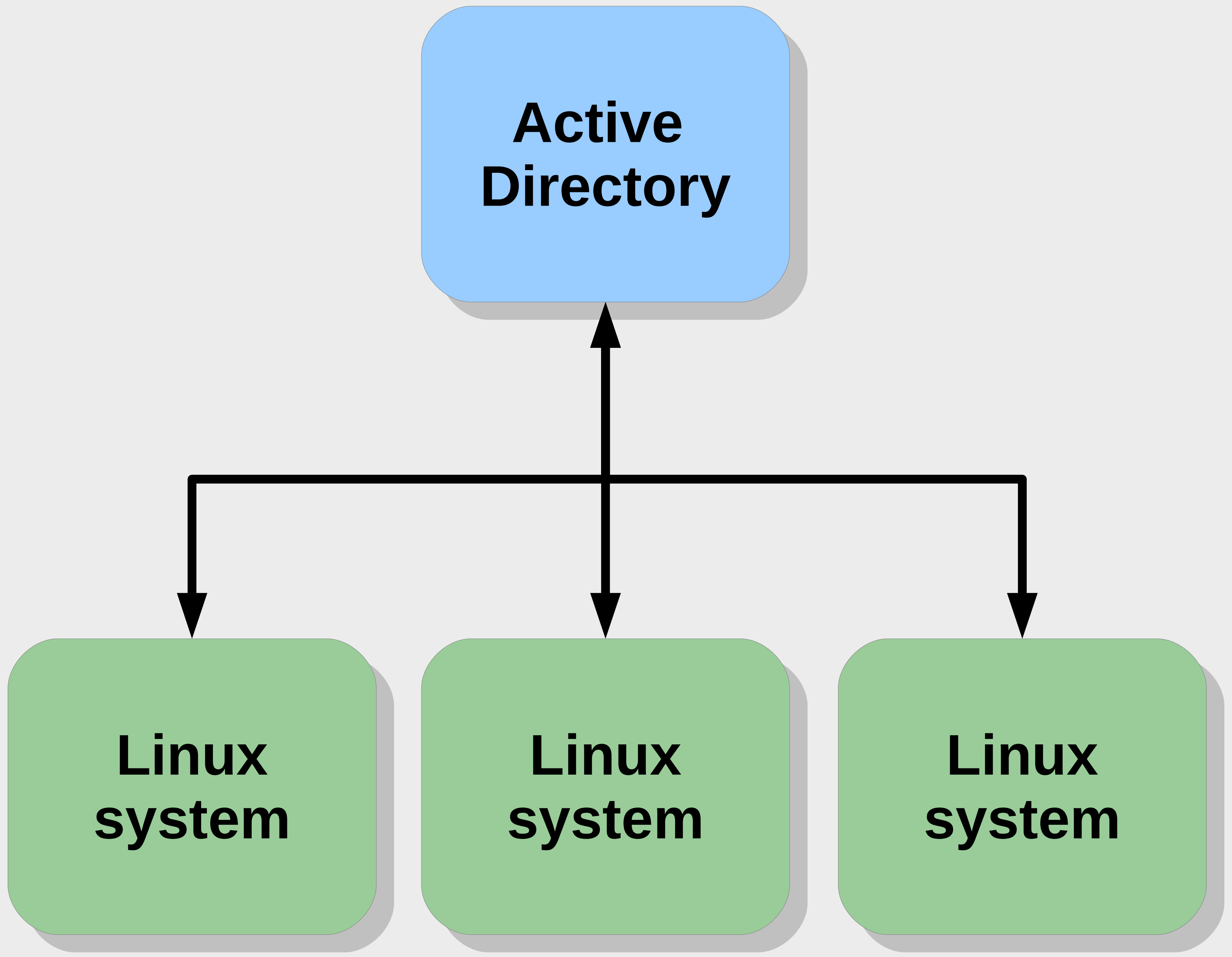
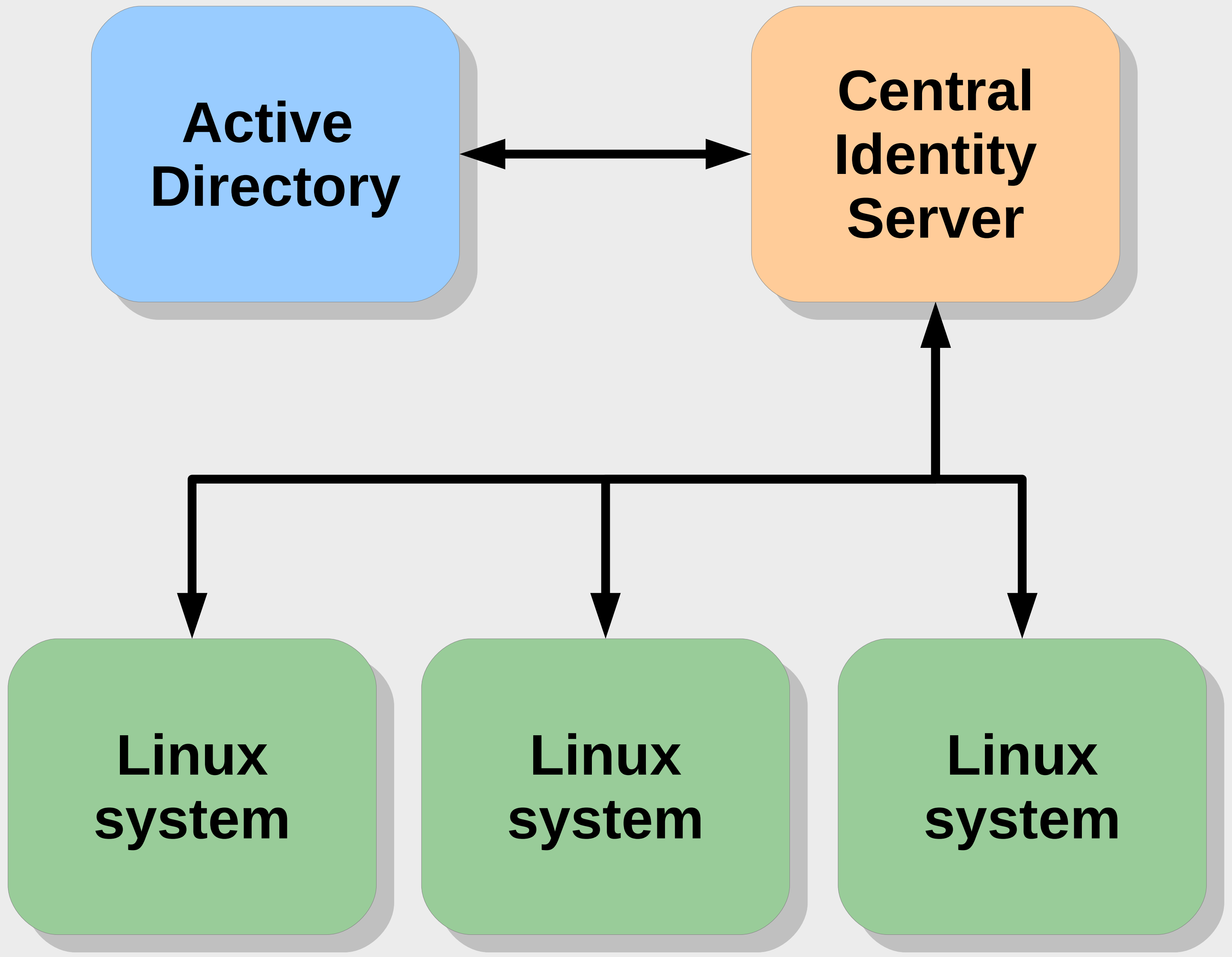
# AD Integration Options

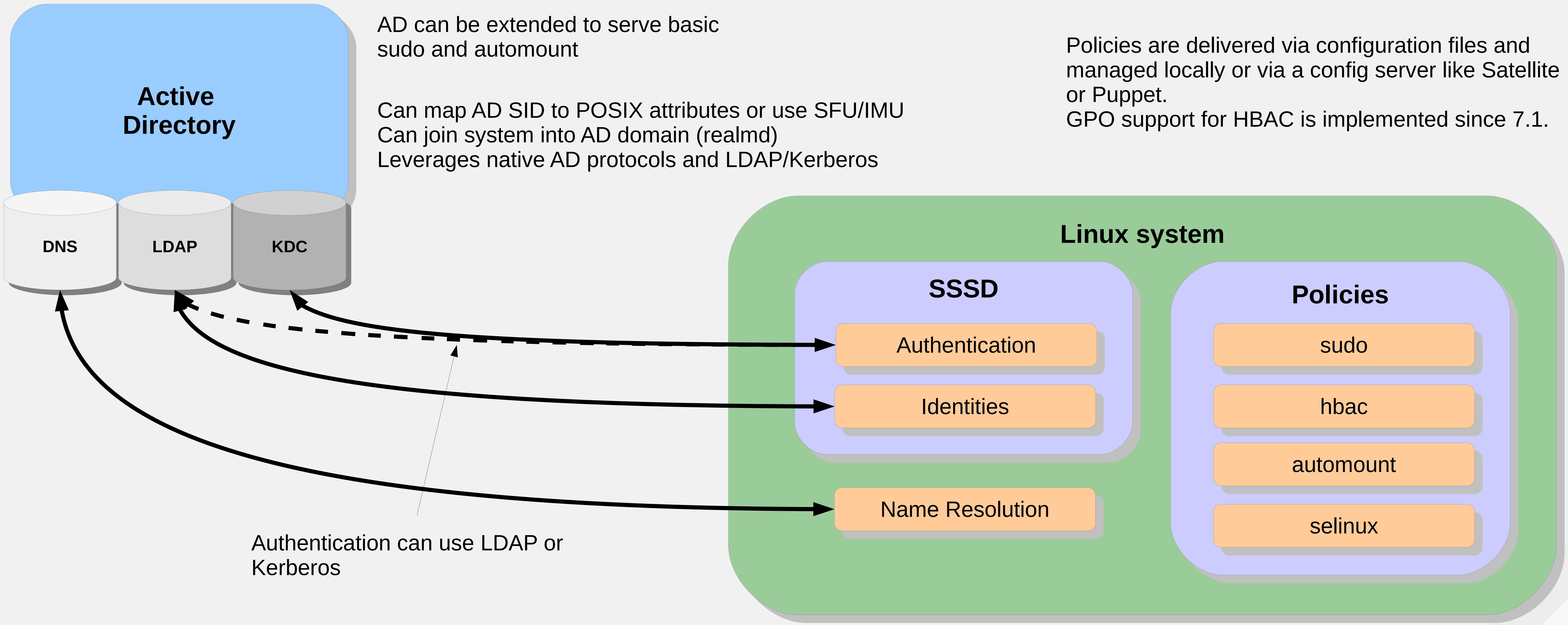
## Direct Integration



## Indirect Integration



# Direct Integration



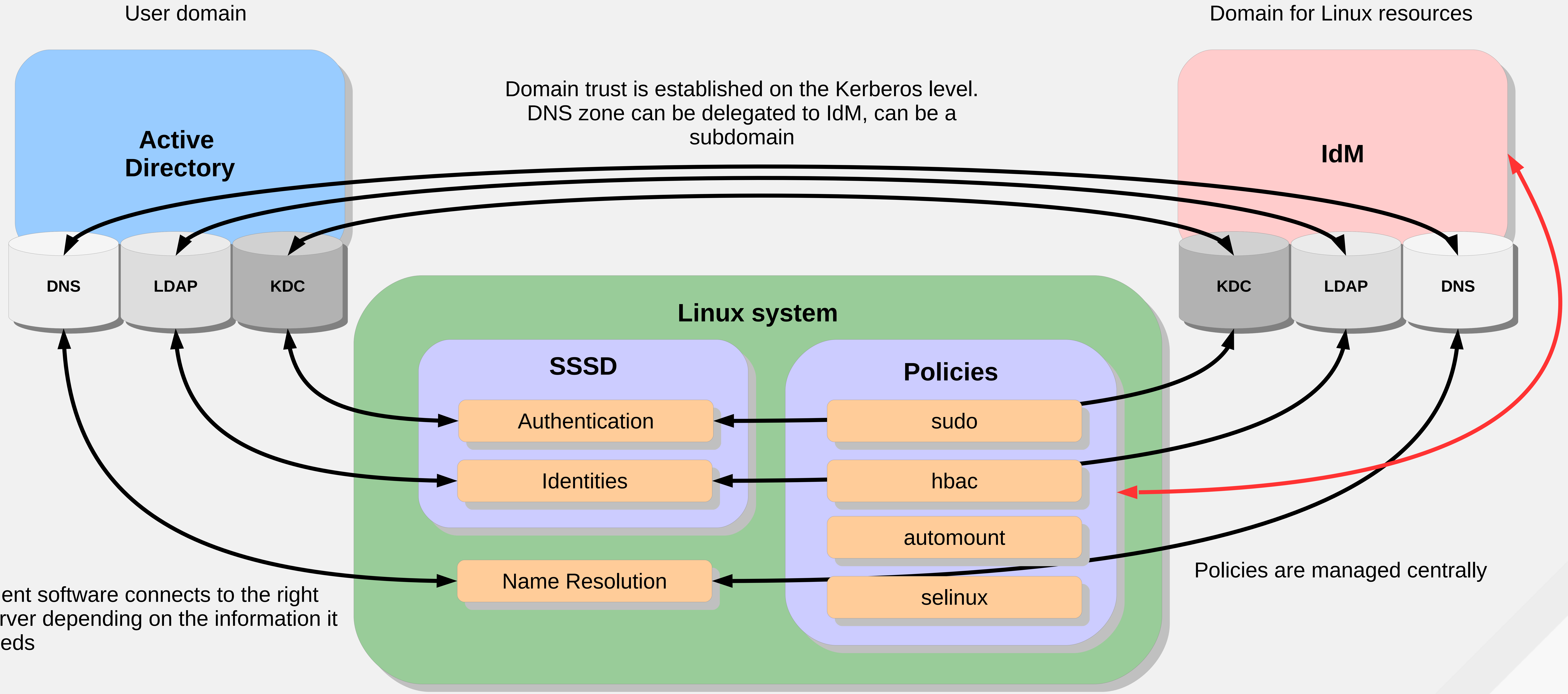
AD can be extended to serve basic sudo and automount

Can map AD SID to POSIX attributes or use SFU/IMU
Can join system into AD domain (realmd)
Leverages native AD protocols and LDAP/Kerberos

Policies are delivered via configuration files and managed locally or via a config server like Satellite or Puppet.
GPO support for HBAC is implemented since 7.1.

Authentication can use LDAP or Kerberos

# Indirect Integration

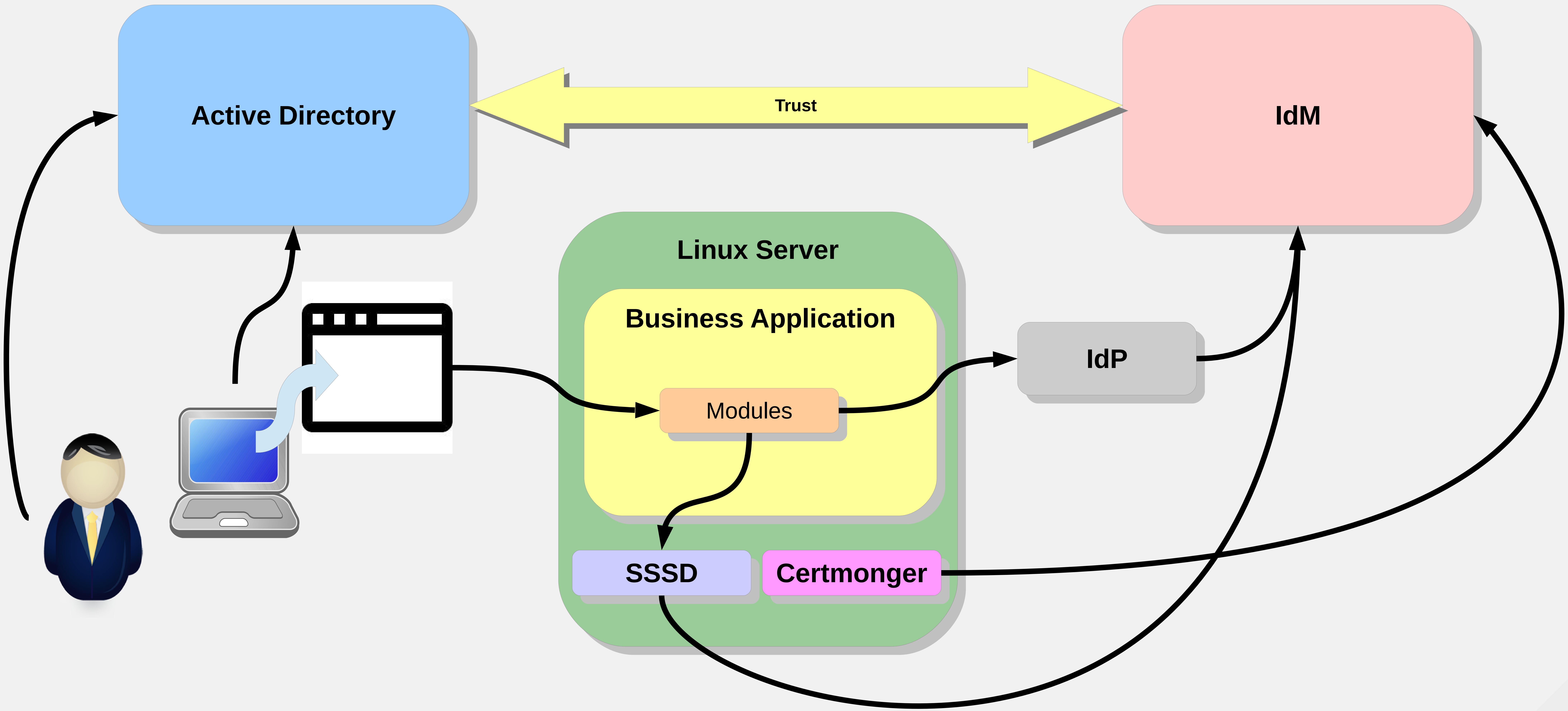


Domain trust is established on the Kerberos level. DNS zone can be delegated to IdM, can be a subdomain

Policies are managed centrally

Client software connects to the right server depending on the information it needs

# Example Architecture



# Cost Effectiveness

# What is the cost?

- All mentioned components and solutions are provided using Red Hat Enterprise Linux without extra charge
- No third party vendors involved
- Deployment is easy and integrated – saves time
- The main cost is server side subscriptions, but one server can serve about 2-3K clients

# Use Cases in Works

# Use Cases in the Pipeline

- Integration of different products in Red Hat portfolio
- Smart Card authentication
- Central key store
- User lifecycle management
- One-way trusts
- DNSSEC

# Future considerations

- Global catalog support
- Authentication indicator in tickets
- Integration with Samba 4 DC
- Full smart card management capabilities
- IdM to IdM trusts

# Pointers and Resources

# Resources

- Blog: http://rhelblog.redhat.com/author/dpalsecam/
- Red Hat Documentation: https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/
- Demo community instance of IdM (FreeIPA): http://www.freeipa.org/page/Demo
- Demo community instance of Ipsilon: https://saml.redhat.com/idp/

# Questions!

- What use cases do you want us to address?
- What challenges do you have in your environment that we did not discuss in this presentation?

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