Next-Generation Directory Services: The Future is Here.
The Forgotten Importance of Directories

Directories have been around for a long time, and many enterprises are still running the same ones they installed 10 or 20 years ago that have become part of the background infrastructure. And even though these directories are critical for operations and a core element of identity and access management, they've often been taken for granted.

Why? Maybe because enterprise directories just aren’t a hot topic in IT. When was the last time you read an analyst report about them? It’s all APIs, cloud, Internet of Things and mobility these days. But the reality is that all this trendy stuff is just another way to connect data and users. And where is all of that important information stored? You guessed it: in directories.
Legacy Directories Are Falling Behind

Businesses are increasingly dependent on their online and mobile applications to provide critical services to their users. And they’re facing several challenges because of issues with the underlying directory infrastructure, including:

- **Explosive growth:** The explosion of user identities and devices and the need to maintain a responsive user experience are challenging many legacy repositories.

- **Speed matters:** In the application economy, users want immediate access to applications and services, and if that doesn’t happen, they’re gone.

- **Dynamic applications:** Security requirements are evolving from simple user authentication to tracking detailed login and personalized information associated with dynamic business operations.

- **Identity silos:** Typically deployed by different business units over time, multiple directories are now causing challenges, including poor user experiences, security risks and increased operational costs.

- **End of life:** Some organizations like Oracle are sunsetting their legacy directories, leaving thousands of customers in a tough situation.
Digital Transformation is changing how users interact online with the enterprise. The number and types of devices and digital intermediaries are increasing at a significant pace, and it’s easy to lose sight of the user behind these devices.

This is driving huge security concerns. For example, what new security exposures and risks are these devices introducing? But more important to the directory, how are these users and devices being managed? Identities are not limited to users; devices have them too, and both require authentication and authorization. Can your legacy directory handle this growth?

Over 2.8 billion smartphone users by 2020¹

Over 38 billion connected devices by 2020²

Over 1.8 billion users of intelligent digital assistants by 2021³

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The app economy has transformed the way that we work and play; however, it’s not without its challenges—first and foremost is user adoption. Businesses can entice users to try their new mobile app, but getting them to continue to use it is another story. A recent study found that on average, 75 percent of users do not return to a mobile app the day after downloading it. This means that, on average, mobile apps only retain 25 percent of their users after two days.

Speed matters. In case you missed the memo, people are impatient, and this is especially true when it comes to mobile apps. They expect the apps to load fast and work properly, or else you’ll hear about it. People will abandon their shopping cart or the app itself if it’s too slow, but they’ll take time to write a lengthy negative review—which in turn dissuades other users from trying your app.

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6 Manish Bhalla, “7 reasons why customers are abandoning your mobile shopping cart,” Ventureburn, Jan 18, 2016.
6 Google Data, Aggregated, anonymized Google Analytics data from a sample of mWeb sites opted into sharing benchmark data, n=3.7K, Global, March 2016.
Dynamic Applications

When directories first appeared, they were primarily used to store user login credentials and personal data. And for the most part, this data was retrieved by users or applications via mostly read transactions. There were changes, called write transactions, but these were performed on a separate instance of the directory, and then replicated to the other instances on a periodic basis. This was referred to as a single-master configuration.

Applications today are much more dynamic. They collect and store lots of data, which requires an underlying user directory that can handle both high levels of read and write transactions simultaneously. In addition, the old paradigm of the single-master configuration is just not acceptable. Every directory instance needs to be able to accept changes and respond to requests—otherwise, you end up with a directory that has poor performance and data inconsistencies.
Identity Silos

As enterprises rushed to deliver new online and mobile applications to their employees, partners and customers, they also inadvertently deployed numerous directories across the environment. This is because it was often easier to stand up a new directory instead of trying to integrate with existing ones. Over the years, many enterprises have consolidated onto Active Directory™ from Microsoft® for their internal users; however, this hasn’t necessarily been done for external user communities. And it’s now causing issues as businesses try to get a single view of user activity. As changes get made to one directory, they may or may not get synchronized with others, resulting in a poor user experience for customers.

To address multiple identity silos and the rapid growth of identities, many organizations have implemented a virtual directory on top of multiple legacy directories. And while this addresses one problem by creating a single view into all the managed identities, it also adds another layer of complexity and latency into the mix. If the legacy directories are not responsive enough for your dynamic, web-scale applications, they cannot be made faster by adding a virtual directory on top of them. So, while you might address one problem, you do nothing to solve the others.
The Oracle Directory Server Enterprise Edition (ODSEE) product has an impressive history, dating back to the early 2000s when it was originally sold as the iPlanet Directory. When iPlanet was dissolved, the directory went to Sun Microsystems, which renamed the product SunOne Directory, and then Oracle renamed it again after acquiring Sun. During this time, thousands of customers deployed this directory in their production environments, where it served as a critical component of their identity and access management (IAM) infrastructure for years.

But Oracle has several directory products, and in an effort to consolidate them, it has announced end of life (EOL) for ODSEE. The current version, 11.1.1x is slated for EOL December 2019, with extended support offered through December 2022. This will leave thousands of customers with a dilemma: “Should I upgrade to the Oracle Unified Directory or explore the market to find another option that may better suit my organization’s requirements?”
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<td>• Low cost of ownership</td>
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Directory performance has a direct impact on application performance. A few milliseconds on the data layer can have a cumulative effect on the application. Applications need to make multiple data calls one after each other. Directory performance can have a direct impact on application threads and numbers of servers. Faster data access means higher throughput on a lower number of threads.
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- High availability across data centers
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Users expect anytime, anywhere access. And for global applications, this means maintaining high availability across all data centers. Because if your directory is down, so are your online applications and services. And if your users cannot access your applications, you’re not doing any business.
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Many legacy directories experience a lag in data replication. This can result in data inconsistencies across the infrastructure, as some instances are waiting for updates, and while they’re waiting, they continue using older data. People want to see their information updated instantaneously, and this requires real-time replication of all data across all nodes.
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Finally, the directory must be able to deliver performance, availability and data consistency without costing a fortune to operate and maintain. Even though the directory is a critical component of your IAM infrastructure, it needs a low total cost of ownership to be viable for your business.
What About the General Data Protection Regulation (GDPR)?

Another factor that could impact organizations—especially those seeking to upgrade their legacy directory—is the General Data Protection Regulation (GDPR), which goes into effect in May 2018. The GDPR addresses how organizations handle personal data, specifically what types of personal data can be exported outside the European Union (EU).

From an IAM perspective, this impacts where user data is physically stored. One of the key requirements for a next-generation directory to comply with the GDPR is the ability to support distribution and routing across its nodes. This allows an organization to create a backbone with directory nodes in different geographic regions, so that user and identity data can be stored in their respective regions. From an application perspective, no changes are needed; the application sees one directory, and when new or modified data is submitted by the application, the backbone can automatically route the data to the appropriate region for storage.
About the Solution From CA Technologies

To deliver next-generation directory services, CA Technologies offers CA Directory: a battle-tested directory server that provides the scalability and reliability needed to support the most demanding consumer applications or online services with minimal infrastructure and personnel resources.

The solution’s innovative design enables ultra-high-speed performance as well as transparent load balancing, multi-master replication and state-based recovery. CA Directory’s web 2.0 management UI and REST-based APIs for management also reduce TCO by facilitating automated operations across distributed deployments. CA Directory continues to set the benchmark for business-critical online services.

In addition, the CA Security Suite provides an important set of complementary capabilities, including:

- A single, comprehensive security solution for web, mobile and APIs.
- End-to-end mobile security from the device to the data center.
- Support for deployment in on-premises, cloud or hybrid deployment environments.
- Deployment flexibility for any customer use case.
- A complete and modular solution with proven, consumer-level scalability.
CA Technologies (NASDAQ: CA) creates software that fuels transformation for companies and enables them to seize the opportunities of the application economy. Software is at the heart of every business, in every industry. From planning to development to management and security, CA is working with companies worldwide to change the way we live, transact and communicate—across mobile, private and public cloud, distributed and mainframe environments. Learn more at ca.com.