***Cloud Migration Security***

1. Active Directory:

For AD, I would recommend keeping it on-site. This is most beneficial to the business due to the fact that Azure AD has its own limitations. These limitations include but are not limited to:

* Azure AD does not understand LDAP, Kerberos or NTLM authentication protocols, making any on-premises applications using Integrated Windows Authentication protocols, stop functioning
* You cannot put a firewall around SaaS applications, making a mobile device management solution a necessity to manage the devices joined to Azure AD
* Device management functional limitations make it difficult/impossible to micro-manage individual registry settings and installations of complex applications
* Azure AD doesn’t provide a counterpart to AD Certificate Services, so if your organization uses client authentication certificates to access the corporate Wi-Fi, there will need to be other authentication options

1. Mail:

Due to the nature of mail itself, being transported physically from place to place, it will need to be an on-site or hybrid feature. As necessary or desired, support staff may scan and upload documents/mail to the cloud for review by the responsible party.

1. Network Storage:

For the network or data storage, I would recommend a hybrid model seeing as it gives you the best of both worlds. This would involve two or more clouds attached to support load balancing between private on-site resources and virtual resources in the cloud. By balancing cost and security, this gives you the ideal configuration seeing as it provides you with the cost-effectiveness of the cloud and the security of a physical server. ISO 27040 addresses storage security and can help with this migration along with NIST 800-53.

1. Customer Facing Applications (on-site, managed internally):

IaaS would be my recommendation for this since it is the most flexible cloud computing model while also allowing you to retain complete control of the infrastructure. Resources can also be purchased as needed and are highly scalable. With IaaS, you are also able to change out specific hardware as the company’s needs evolve and grow.

1. Security Controls around Customer-Facing Applications (WAF, Blocklist, etc.):

I would recommend keeping all items regarding security on-site. While there are options out there to alleviate the workload for the company, they also add unnecessary risks. I would apply NIST 800-53 to these controls.

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1. Applications (on-site, managed by 3rd party):

To provide a more stream-lined process for workflows and scalability, I would recommend PaaS for this item. PaaS is able to provide speed and flexibility when working with 3rd party vendors. This is also able to reduce costs and potentially relieve some challenges with rapid developments regarding an app.

1. Applications (hosted off-site by software vendor):

Depending on the amount of usage that these applications experience through your company, I would recommend SaaS. This will decrease the time and funds spent on monotonous tasks such as installing, managing, and upgrading software, providing more time for staff to tend on more important company matters.

1. Security Controls (Network Security Monitoring, IPS, Netflow, DNSSEC, Configuration mgmt., etc.):

I would recommend keeping all items regarding security on-site. While there are options out there to alleviate the workload for the company, they also add unnecessary risks. I would apply NIST 800-53 to these controls.

***Resources***

1. <https://www.softcat.com/blog/on-premises-active-directory-can-i-remove-it-and-go-full-cloud>
2. <https://www.itjones.com/blogs/2020/2/15/should-you-migrate-your-on-premises-server-to-the-cloud>
3. <https://www.itjones.com/blogs/nas-vs-server-vs-cloud-which-data-storage-is-right-for-you>
4. <https://www.bmc.com/blogs/saas-vs-paas-vs-iaas-whats-the-difference-and-how-to-choose/>