Technology Architecture Group at Duke University

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TAG- Technical Architecture Group

identify and track emerging technology - raise issues for CIO's consideration

review major decisions - technical resource for senior OIT leadership

champion appropriate technology and balance technical elegance with functional needs

scope is primarily OIT-sponsored efforts

TAG

CIO created TAG in May 2007

8 senior technical staff from across OIT units -- working by rough consensus

one member from the CIO's senior team

weekly TAG meetings - frequent visitor/guest attendance

rotating representation at campus IT advisory committee, CIO's staff meetings, etc.

TAG's work

identify and track - IPv6 issues, Exchange, load/ performance metrics

review decisions - Campus Event Calendar, Storage/ SAN, NotifyLink, Pinnacle, Mail Delivery system

integrated into project management lifecycle process

champion appropriate technology - issue reviews, architectural principles

why principles?

a yardstick for technical system decision making

a tool for strategic leadership

catalyst for setting cultural norms

alignment with Duke's mission

sustainable technology for current and forecast infrastructure

principles address 4 areas

data - information we are tasked with storing, managing, transmitting, and otherwise handling

infrastructure - servers, networks, and facilities that enable us to provide services

services - applications and systems that deliver data, through our infrastructure, to our users

support - people, process, and organizations

1 robust, secure systems

Robust systems are designed to tolerate failure of individual components without service interruptions. By building solutions with independent, redundant components we can achieve high availability in an environment where they are intertwined. We consider potential component failure modes when engineering systems, and validate our designs' security and fault tolerance as part of pre-deployment testing. Unanticipated failures of deployed systems are studied so that we adapt and improve our architecture over time.

2 link, don’t duplicate

On both micro and macro scales, modular, loosely coupled architectures ensures that solutions are reusable, testable, adaptable, manageable, and supportable. The use of standards ensures that we will leverage the largest base of available knowledge while achieving the highest level of inherent interoperability. Reusable implementations of data, infrastructure, and service needs are preferred to duplication of efforts. To avoid duplicate entry of data, systems of record should be established and linked to rather than copied.

3 design for scalability

Systems should perform well, even in the face of rapidly-expanding demand. We can prepare for the future by designing systems to accommodate growth in usage over time - allowing for easy and economical scaling when demand rises. In general, horizontally-scaled solutions are better able to adapt to changes in load and provide better overall performance than vertically-scaled solutions. Similarly, modular solutions can provide more flexibility in scaling than monolithic architectures.

4 design for information lifecycles

Our system designs explicitly address the "cradle to grave" lifecycle migration of data and application technologies. As such, we make sure to plan not only for the initial deployment, but ongoing maintenance and eventual decommissioning of a solution. We avoid strategies that make upgrade or replacement of a solution more difficult. By designing for decoupled, independent solutions, we are prepared for future technical and data migrations.

5 adapt to realities of people and technology

Solutions and services should leverage Duke's existing intellectual and technological resources whenever possible. These resources define our environment and shape our organizational capabilities. Realizing the capabilities of existing staff and our technical environment, we can more effectively meet our projects' technical goals. Creating services that work with existing human and technical investments allow us to maximize the return on these investments.

principle development process

TAG drafted principles

focus groups used to refine principles

OIT-wide staff survey

evangelism via communications plan

practical application via case studies

case studies examples

e-mail slowdowns

network issues

phone system outage

TAG's ongoing work

technical review/acceptance function for major projects

continuing influence on OIT technical culture

case studies/issue reviews

ongoing evaluation of architectural principles

ongoing communications

technical advocacy