



NORTH TEXAS
ISSA
#NTXISSA

Are We Smarter than a Fifth Grader?

John South

CSO

Heartland Payment Systems

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Difficult Words that Start with “A”

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In Euclidean space, which of the following is an **ANGLE**?



Difficult Words that Start with “A”

What is an **arduino**?

- A.** A small computer on a board that can be used to experiment with circuits and to prototype IoT devices
- B.** A type of Italian pasta that is often cut in the shape of The letter “R”
- C.** An Italian contraction meaning “arduous journey”
- D.** The name associated with the flat plains between the Mountains around Lago di Garda, northwest of Milan

Difficult Words that Start with “A”

Define **atlatl**?

- A.** An amulet typically of lapis lazuli that is associated with the god Osiris
- B.** A throwing spear system used by ancient native Americans
- C.** The Incan god of war often represented as a thunderbolt
- D.** A species of turtle that lived during the Jurassic period, growing to the size of a Volkswagen Beetle

Difficult Words that Start with “A”

Define **axolotl**?

- A.** An Aztec word for a small hand weapon made from early amalgams of copper and tin, believed to be part of the sacrificial practices against captured enemy
- B.** A vegetable grown in ancient Mexico that is the predecessor to the modern tomato
- C.** A type of salamander that never progresses past its larvae stage where their gills are prevalent outside of their bodies
- D.** A organic carbon chain that is interpreted by our sense of smell as the odor of dirty socks

Difficult Words that Start with “A”

You work through the budget season with your team to develop a thorough business case justifying the addition of 10 new headcount. You present that case to you CIO and the Board. To your surprise, they approve your plan.

You contact both your internal and external recruiters. They feel confident they can find a good number of qualified candidates in the DFW area who have demonstrable security experience.

The recruiters send you a number of candidates, most of whom meet only the barest minimum of your security job requirements. After interviewing them, and determine their salary demands you find:

Difficult Words that Start with “A”

- A.** A number of the candidates really stretched their qualifications to match the “buzz” words in your job description
- B.** Some of the candidates hold CISSP, CISA and CISM credentials, but when questioned on the details of their security strategy, they know few of the details of how that strategy was implemented
- C.** When you find a candidate with at least the minimum requirements, they price themselves at a salary rate that is 50% above the average in the DFW market.
- D.** You find yourself feeling very frustrated

What is the first “A” word that emanates from your lips?

Many Options Available to Us to Discuss

- Vulnerability management

- Patching

- Logging

- Encryption of data at rest and on the move

Security101

Assumption

- What's the assumption in every one of these elemental components of security?

That you have a body to perform the function

- What happens when you don't have enough bodies to fill the positions in your security team?

Difficult Words that Start with “A”

What is the “A” word the emanates from your mouth?

Argh!

ihgrA

Let's break this down a bit

- Bureau of Labor Statistics estimates 1.4 million openings in the IT workforce by 2020.
- However, only 400,000 computer science graduates with necessary skills to fill the positions
- However, we are already feeling the pinch
- 451 Research showed that 34.5% of security managers cited lack of experience for the reason they didn't fill their security positions
- In the DFW area, for some security specialties, there aren't even poorly qualified candidates

Let's break this down a bit

- Identity theft Resource Center reports that there have been 577 reported breaches amounting to 155,825,425 (as of 9/29/2015).

www.idtheftcenter.org/images/breach/ITRCBreachStatsReportSummary2015.pdf

- We are seeing an increased interest on the part of CEO and senior executives to increase their security investments
 - 76% were concerned about cybersecurity threats (59% in 2014)

PwC, 2015 U.S. State of Cybercrime Survey

- BDO USA, LLP reported the 67% of CEOs dedicated money to cybersecurity

Let's break this down a bit

- BDO USA, LLP reported the 67% of 100 CEOs dedicated money to cybersecurity
- Of those who upped spending:
 - 90% purchased new security tools
 - 72% created a formal response plan
 - About half of them turned to external security consultants
 - 30% hired a Chief Security Officer

<http://https://www.bdo.com/news/2015-march/tech-cfos-counter-cybersecurity-threats>

Let's break this down a bit

- Over the last 5 years – 90% increase in demand for cybersecurity professionals – roughly 3x the growth rate of the field itself (Burning Glass Technologies)
- The high job rate has directly impacted universities who are creating cybersecurity programs
 - 744 offer something from a certificate to a Ph.D.
 - US News & World Report ranked Information Security Analysts as 8th in the top 100 best jobs in America – growth rate 36.5%

<http://money.usnews.com/careers/best-jobs/rankings/the-100-best-jobs>

These numbers concern me. Why?

Lack of action

- It takes a relatively long time to turn the ship of academic institution.
- Programs are developed a year or two in advance
 - Curricula have to be developed, texts determined and professors assigned to teach the course
 - You also have to change the “culture” of the impacted departments
- But more importantly, you have to have a student base interested in cyber security, IT or any other cyber technical field

Let's move backwards in our equation

- We have an mathematical statement that we want to eventually rationalize:
- Growth rate of profession \leq number of students graduating with security degrees \leq number of students graduating with science and technology degrees
- Here's the rub. The number of students graduating with science related degrees is anemic
- And...the overall quality of our students is abysmal!

Let's move backwards in our equation

- The quality of our educational process is moving backwards, not forward
 - 44% of US high school graduates were ready for college-level math
 - 36% ready for ready for college-level science
 - 19.5% of Advanced Placement test takers in the class of 2012 earned a qualifying score on an AP exam
- 38% of students in higher education who start with a STEM major do not graduate with one

<https://www.nms.org/AboutNMSI/TheSTEMCrisis/STEMEducationStatistics.aspx>

- Why are these rates so abysmal?

Abysmal Education = Abysmal Students

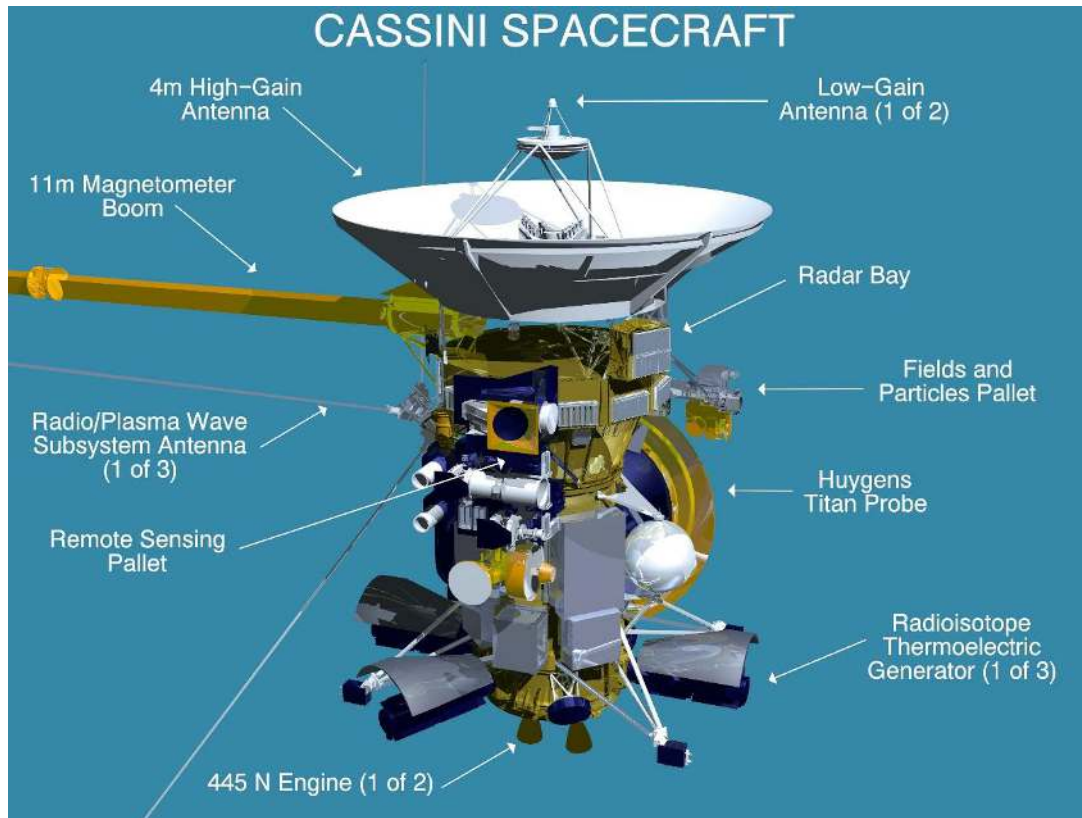
- We have lowered our education levels to the LCD
- We try so hard to ensure that no is left behind, we don't challenge the really gifted (unless they are lucky enough to get into a gifted program)
- More importantly, the quality of what and how we teach our children in the sciences is also deficient.
 - In 2007, about 1/3 of public middle school teachers did not major in or specialize in the science that they were teaching
- We make science boring – memorize this chemical equation or this mathematical theorem. This turns kids off to the sciences - fast

Abysmal Education = Abysmal Students

- Why is it important to really turn kids on to the STEM subjects as early as elementary school, middle school at the latest?
- Let's look at an example for what happens when it all clicks.

Science education pays off

Cassini spacecraft was launched October 15, 1997



Entered orbit around Saturn on July 1, 2004

December 25, 2004, Huygens separated from Cassini and landed on Titan on January 14, 2005

Science education pays off



Marco Mastroguiseppe



Jason Hofgartner

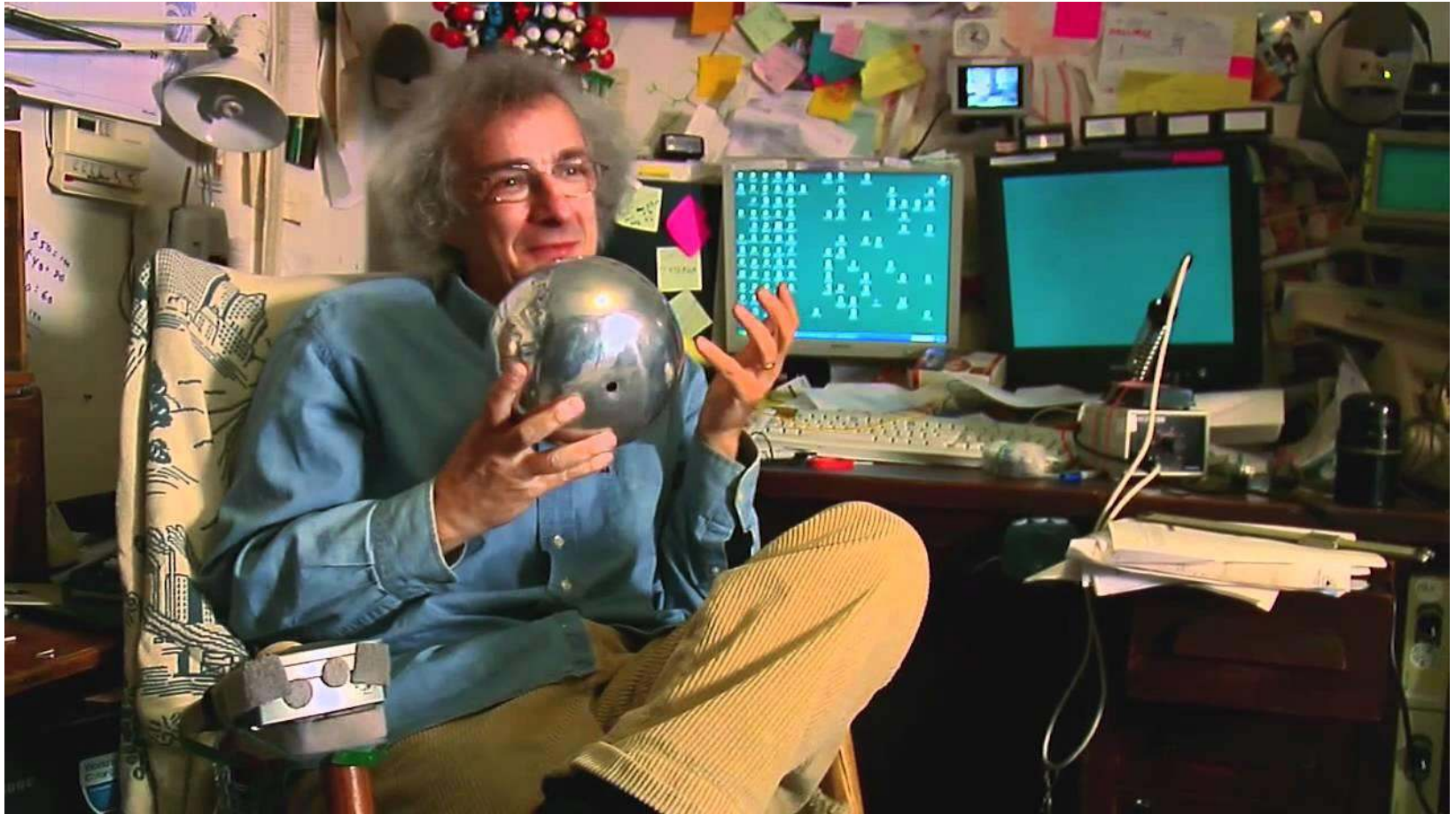
- Cassini carries a RADAR capable of measuring not only surface features but also depth of methane lakes on Titan
- Both of these researchers were in middle school when Cassini was launched!

Astronomy, Oct, 2015, pp 28-29

What are we missing in the equation

- We have a restrained and antiquated science pedagogy in our middle and high school programs
- We teach facts and figures with limited hands-on training
- Reasons
 - Time
 - Curriculum restrictions
 - Dedicated, but perhaps under-trained teachers

- Enter Clifford Stoll



Imagine, design, plan, make and play

- Let's take the last point first (and last)

PLAY

- ▶ We no longer teach our children to how to play
- ▶ BS meters just hit maximum

Imagine, design, plan, make and play

- Our son/daughter/other plays

Organized sports

- ▶ Nothing wrong with organized sports at all.
- ▶ It's a great way for kids to learn teamwork, get physical activity and for a lucky few may open up opportunities that may not have been available to them otherwise.

Imagine, design, plan, make and play

- We have to keep this is context for our kids

How many kids actually get an
the opportunity from organized
sports?

- ▶ The odds are NOT in their favor.

Imagine, design, plan, make and play

Student Athletes	Men's Basketball	Women's Basketball	Football	Baseball	Men's Ice Hockey	Men's Soccer
Percent High School to NCAA	3.3%	3.7%	6.5%	6.8%	11.3	5.7
Percent NCAA to Professional	1.2%	0.9%	1.6%	9.4%	0.8%	1.9%
Percent High School to Professional	0.03%	0.03%	0.08%	0.50%	0.07%	0.09%

NCAA Research, Estimated Probability of Competing in Athletics Beyond the High School Interscholastic Level, Updated 9/29/2013

Imagine, design, plan, make and play

- Obviously not referring to that type of “play”
- What I’m referring to is Play that

Stimulates

Inspires curiosity

Fundamental learning component

Imagine, design, plan, make and play

- Call it what you will

Tinkering

Hands on exercises

Futzing around

Imagine, design, plan, make and play

- This brings us back to

Imagine

Imagine, design, plan, make and play

- San Francisco's Exploratorium



Imagine, design, plan, make and play

- People can take these interactive experiences and their imagination to fuel their creative juices



Design



Imagine, design, plan, make and play

- People can take these interactive experiences and their imagination to fuel their creative juices



Plan



Imagine, design, plan, make and play

- Keystone to what we are missing in today's educational process

Imagination + Design + Plan + Make =

Critical Thinking

Bringing us back to today

- Critical thinking is one of the most important assets of a security person
- How do we find people with that skill?
- Do we test for that skill today?
- Certainly in shops like Google, interns are tested for their creativity, imagination, resourcefulness and aptitude
- But that's fairly rare
- Most companies hire interns, give them assignments and judge their capabilities from the quality of their work – but they don't invest the time to look at their underlying motivations and creativity.

Bringing us back to today

- Identified three problems in all of this
 - We don't have enough people to fill all of the security positions that we have today
 - The critical thinking skills of many of our applicants is an unknown factor
 - Our educational system is failing to inspire our children in the sciences

Tying it all together

- We have to inspire them at an early age to enjoy not only science, but also to enjoy LEARNING about science
- We have to help them learn critical thinking skills starting off by teaching them how to play
- We have to build security into everything they learn about science, so they always have security as part of their thinking

Tying it all together

- We have to search out new pipelines for talented people that could mature into talented security personnel
- If we work with interns, we have to make learning fun for them – take them beyond projects and help them develop their critical thinking skills with hands on exercises
- We have to stop looking for experienced people only and take risk on some talented people who aren't “classically trained” security people

Tying it all together

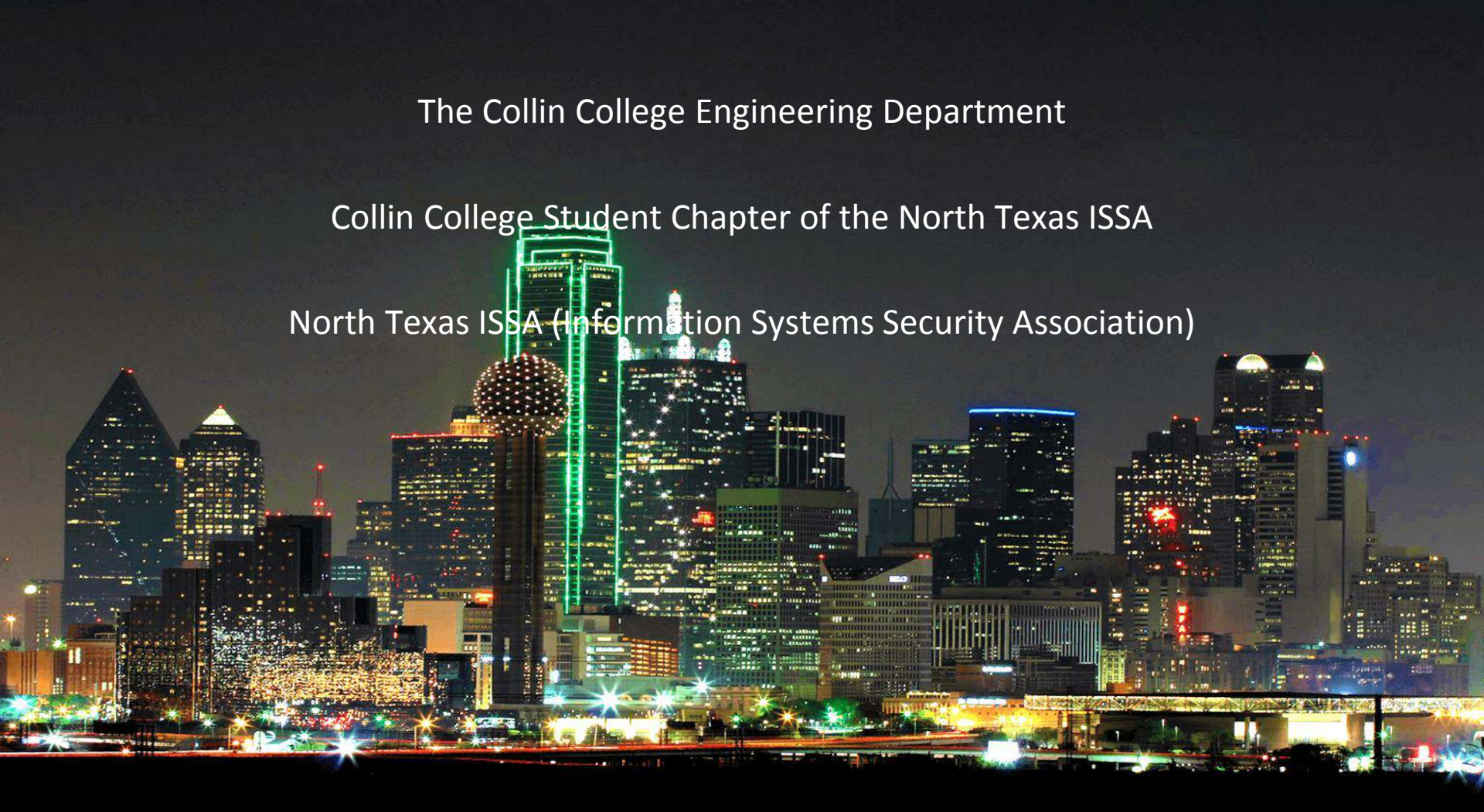
- Most importantly, we have to be smarter than a fifth grader.....

even if it means tricking them into thinking learning science is fun

The Collin College Engineering Department

Collin College Student Chapter of the North Texas ISSA

North Texas ISSA (Information Systems Security Association)



Thank you

