

BOOM! **From Combat Engineer** **to Software Engineer**

**Applying Military Lessons and Experience to
Delivering Software Solutions**



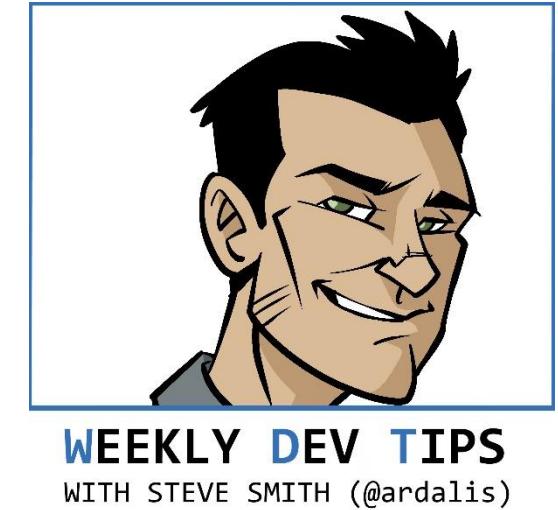
Steve Smith

Former US Army Captain and Combat Engineer Platoon Leader; Iraq veteran

@ardalis

Find Steve Online

- Ardalис.com
 - Iraq Archive <https://ardalis.com/2004/04>
- WeeklyDevTips.com (Podcast)
- @ardalis
- GitHub.com/ardalis
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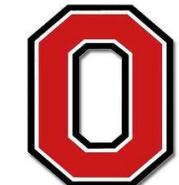


WEEKLY DEV TIPS
WITH STEVE SMITH (@ardalis)

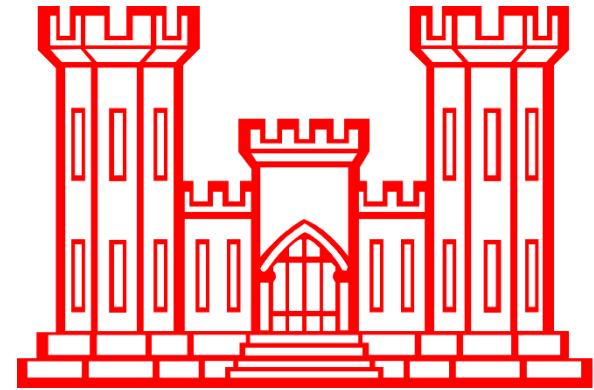


My Military Career

- Enlisted in Ohio Army National Guard as an E-3 at age 21
- Joined ROTC at The Ohio State University
 - Graduated and was commissioned a 2LT
- Branched Engineers
 - Became a Platoon Leader in 112 EN BN OHARNG
 - Promoted to 1LT
- Deployed from IRR to Iraq in 2004 (Operation Iraqi Freedom)
 - Promoted to CPT
- Resigned commission in 2005



Combat Engineers

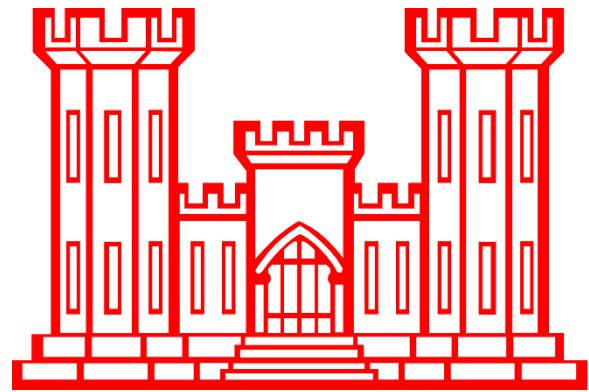


- Combat Arms Branch of the US Army
- MOS: 12B / 21B (enlisted/officer)
- Motto: *Essayons!* – “Let us try!”
- Branch Insignia: Castle
- Also known as *Sappers*

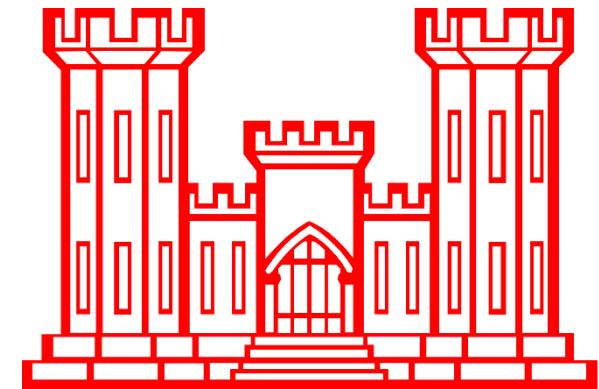




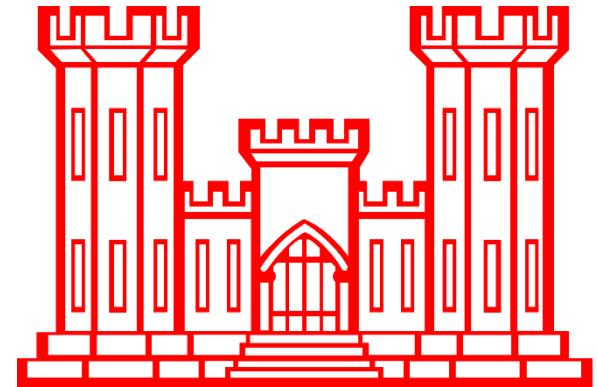
Primary Missions



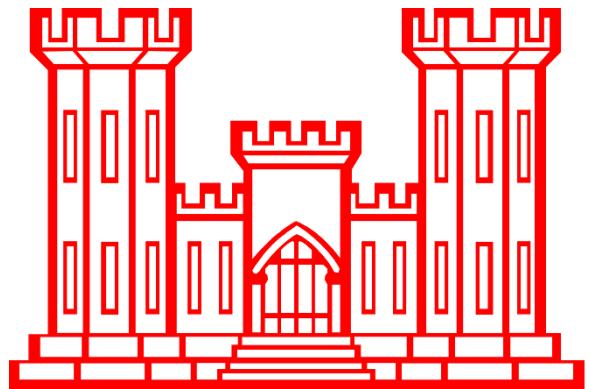
Mobility



Countermobility



Survivability

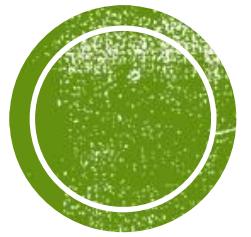


It's been said...

“The primary mission of the Army is to hurt people and break things.”

In software development, we call these folks **testers**.





Be a Force Multiplier

A hammer is a force multiplier. Force multipliers let you get more done with less effort.

Combat Engineers

- Mobility
- Countermobility
- Survivability



Software Teams (and software)

- Create scalable revenue streams
- Increase efficiency and effectiveness of existing teams
- Provide actionable information and insights
- Produce direct value beyond the work they provide (Intellectual Property)





Demolitions and Explosives

A big part of my past job as a Combat Engineer







Attention to Detail

Little things make a big difference

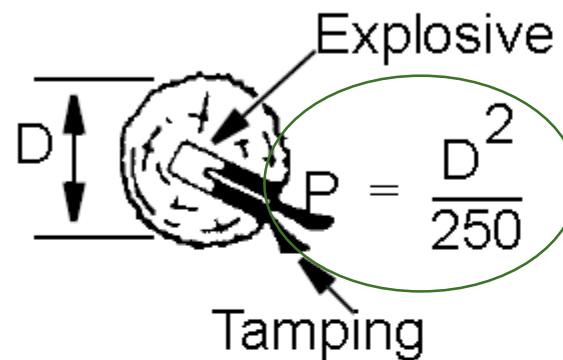
A horizontal collage of three grayscale images showing close-up details of a car's exterior. The first image shows a section of the front bumper. The second image shows a similar view from a slightly different angle. The third image shows a close-up of a wheel and tire.



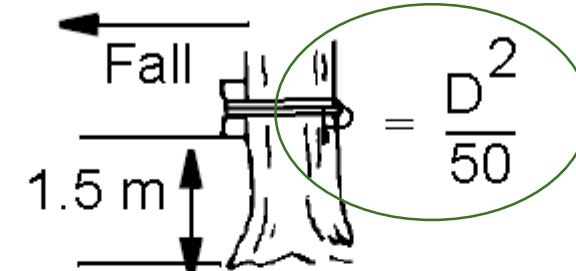
‘p’ for Plenty

Many explosives equations use ‘p’ to refer to pounds of explosives.

Internal charges

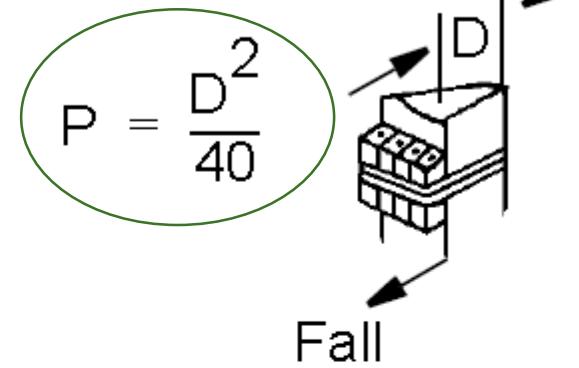


Abatis



Where "D" is the least dimension, in inches

External charges



Type of Charge	Packages of C4 Required (1.25-lb Packages) by Timber Diameter (in)											
	6	8	10	12	15	18	21	24	27	30	33	36
Internal	1	1	1	1	1	1	2	2	2	3	3	4
External	1	1	2	3	4	5	7	9	11	14	17	20
Abatis	—	—	—	—	—	—	—	7	9	11	14	16

“Hardware Hides Many Sins”











Obstacle Design Patterns

Design patterns aren't just used in software...

FM 5-34/MCRP 3-17A

ENGINEER FIELD DATA



HEADQUARTERS, DEPARTMENT OF THE ARMY

US MARINE CORPS

July 2005

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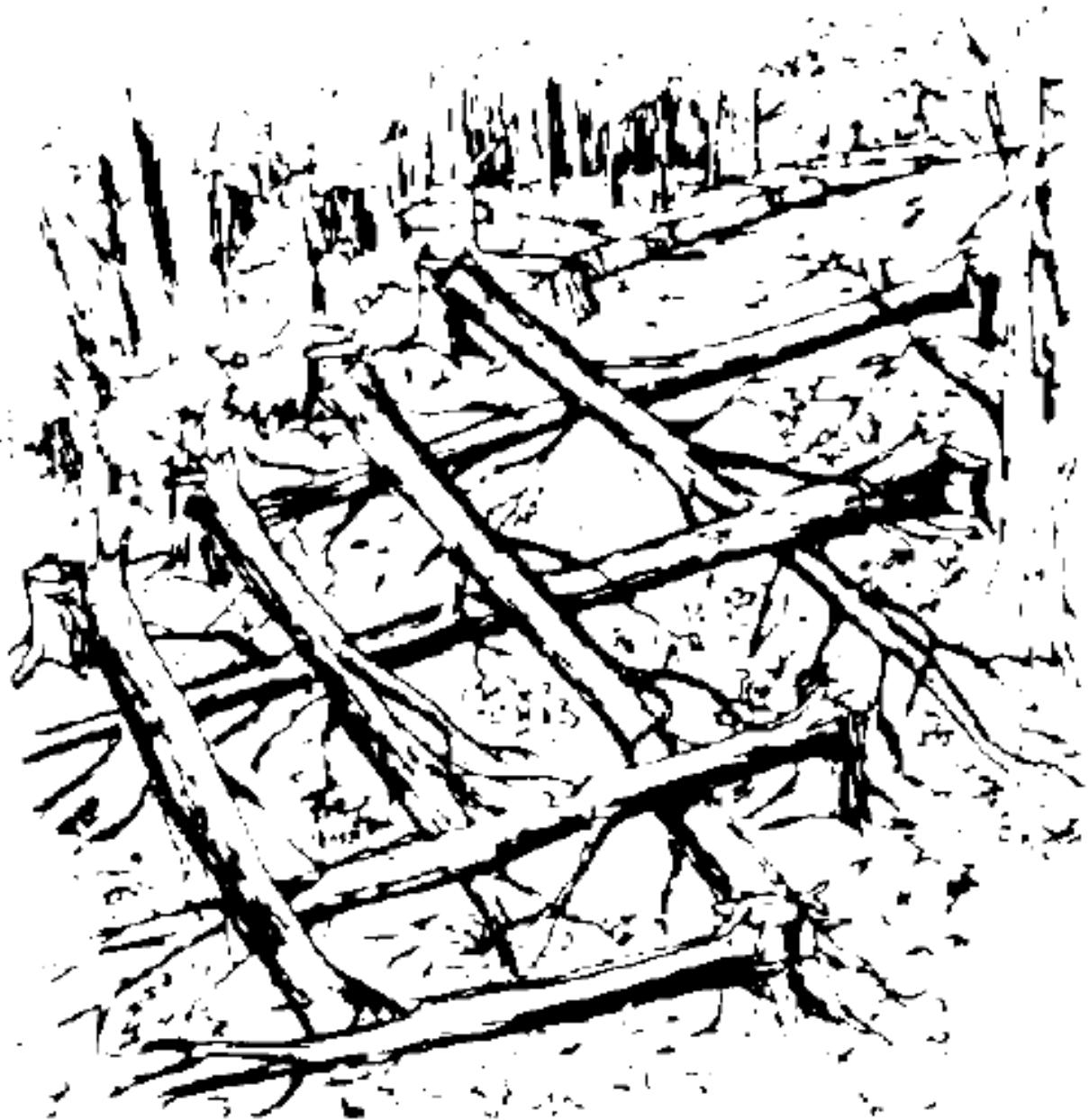
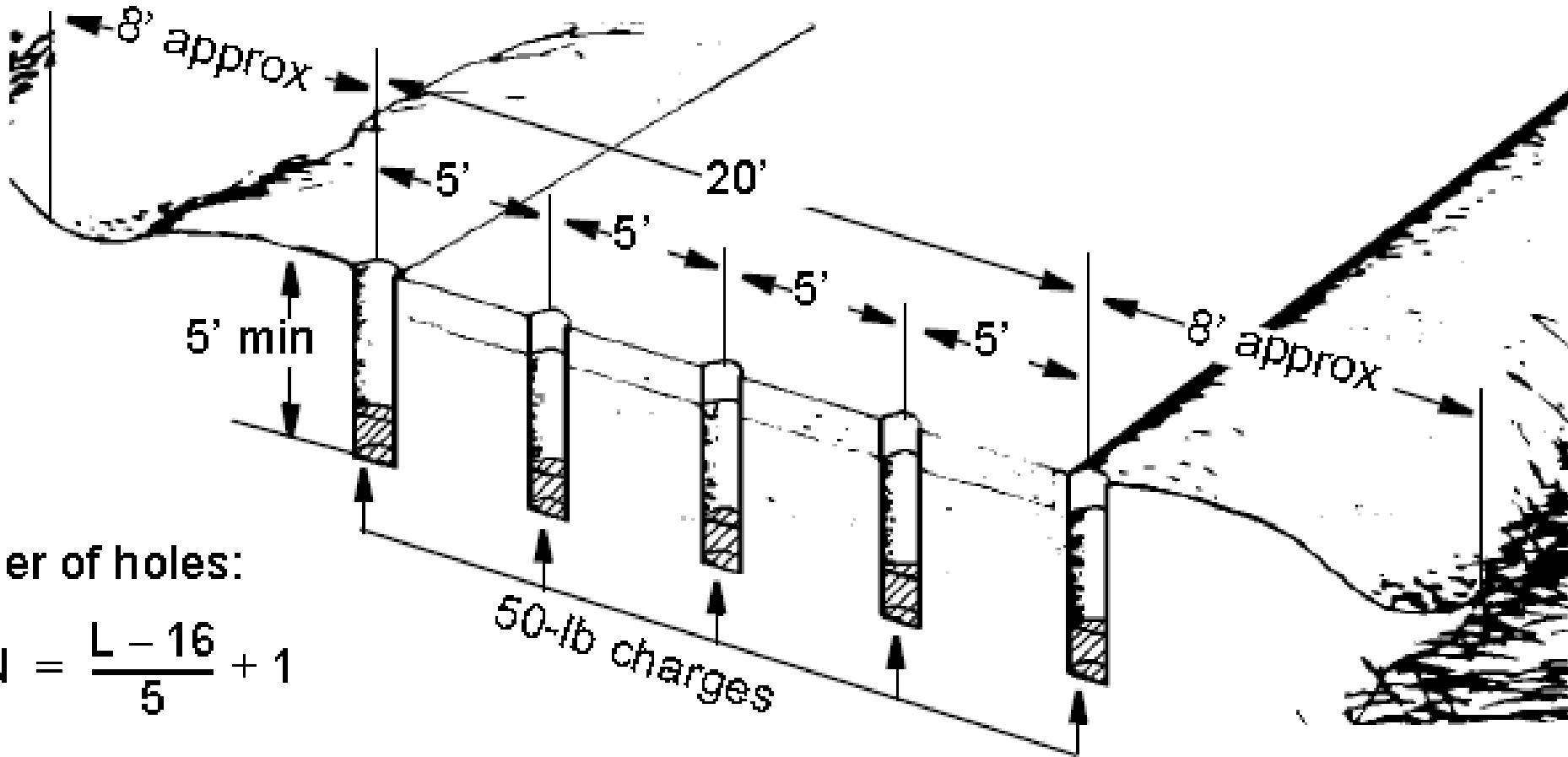


Figure 9-8. Abatis





Number of holes:

$$N = \frac{L - 16}{5} + 1$$

L = length of crater, in feet

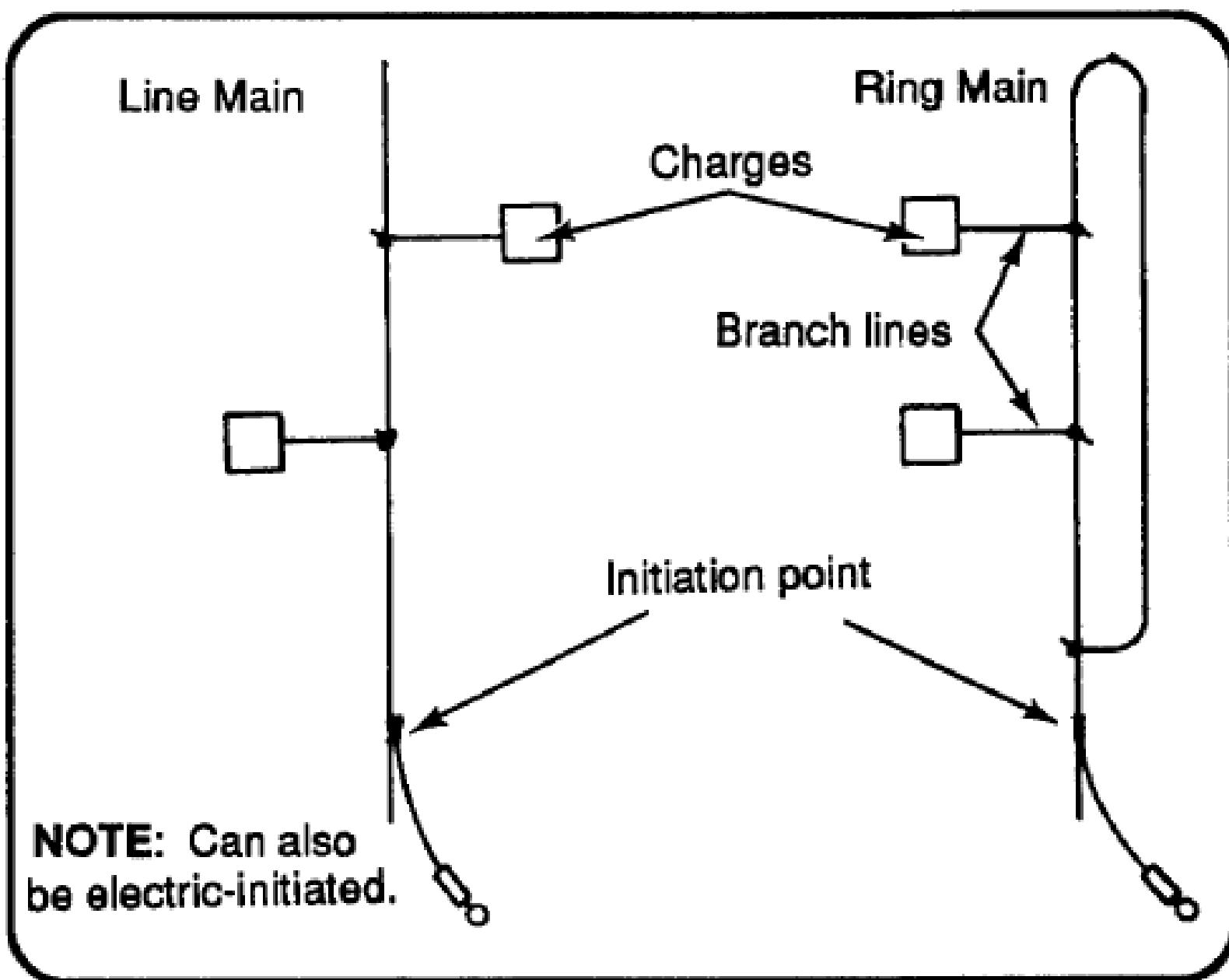
Load holes with 10 pounds of explosive per foot of depth

Figure 9-13. Hasty crater



Avoid single points of failure

Always have a backup plan



**Figure 2-25. Single-firing system
(single-initiated, single-fired, single-primed)**



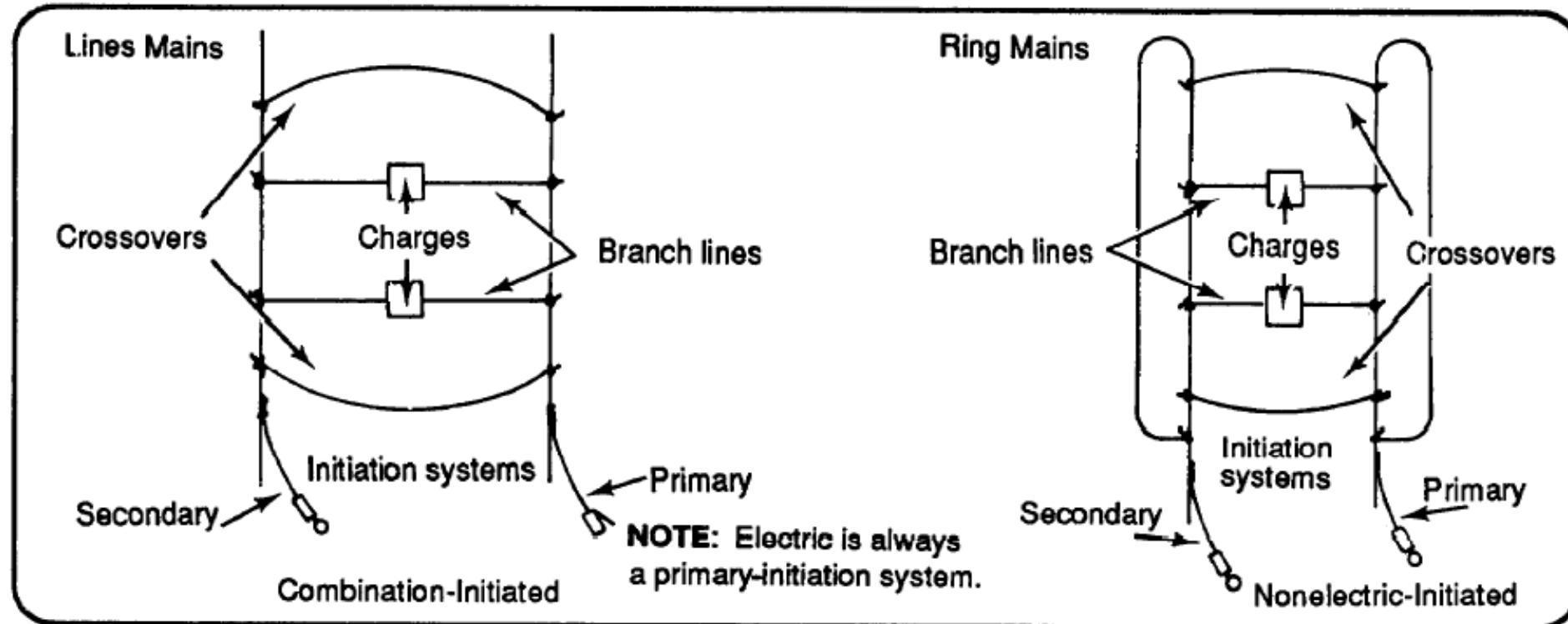


Figure 2-27. Dual-firing system (dual-installed, dual-fired, dual-primed)

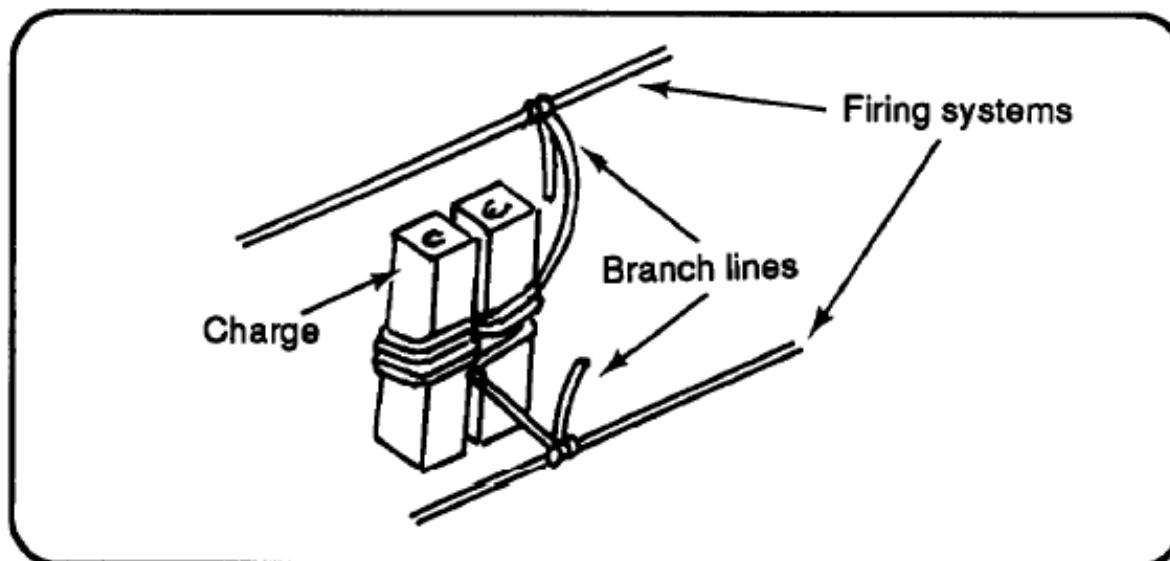
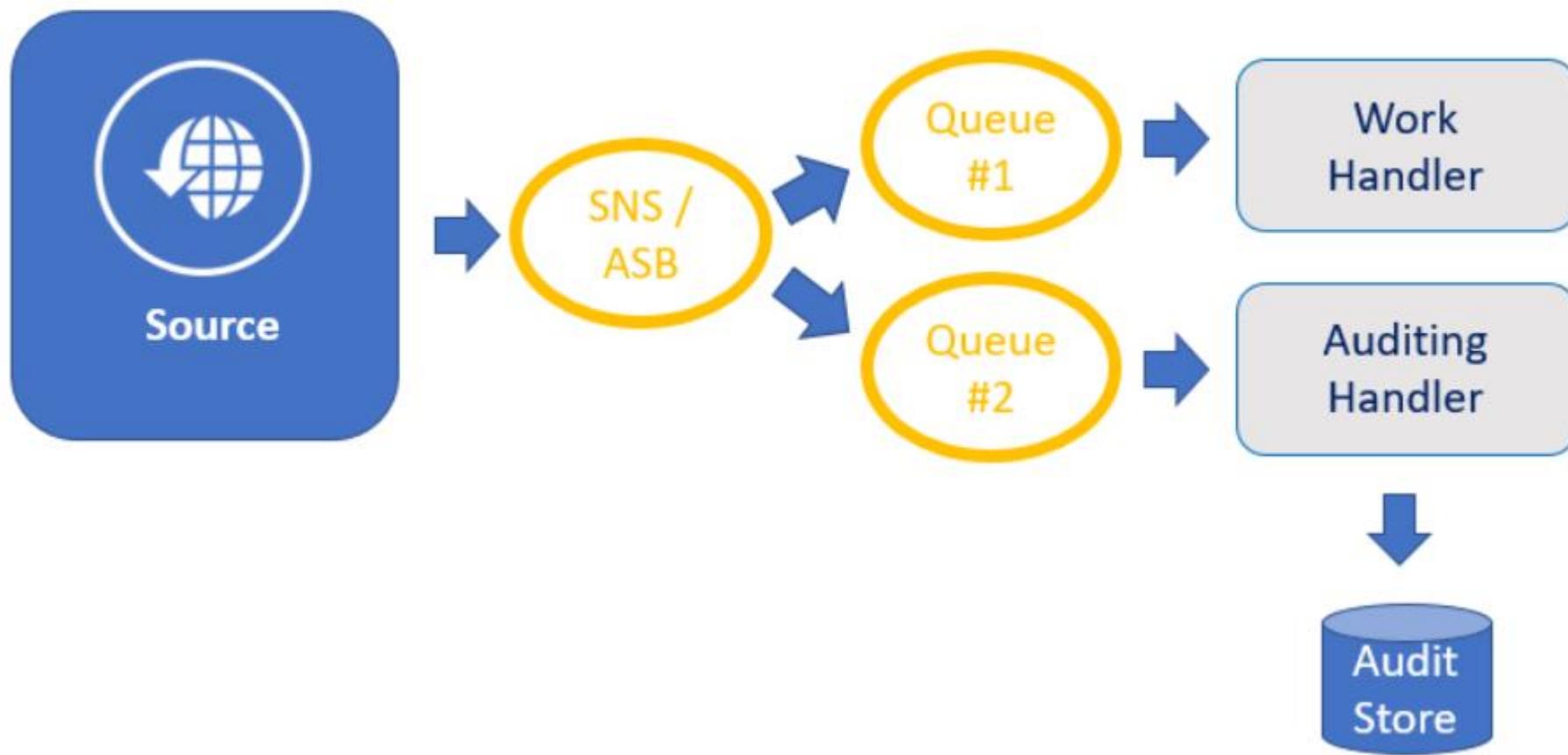
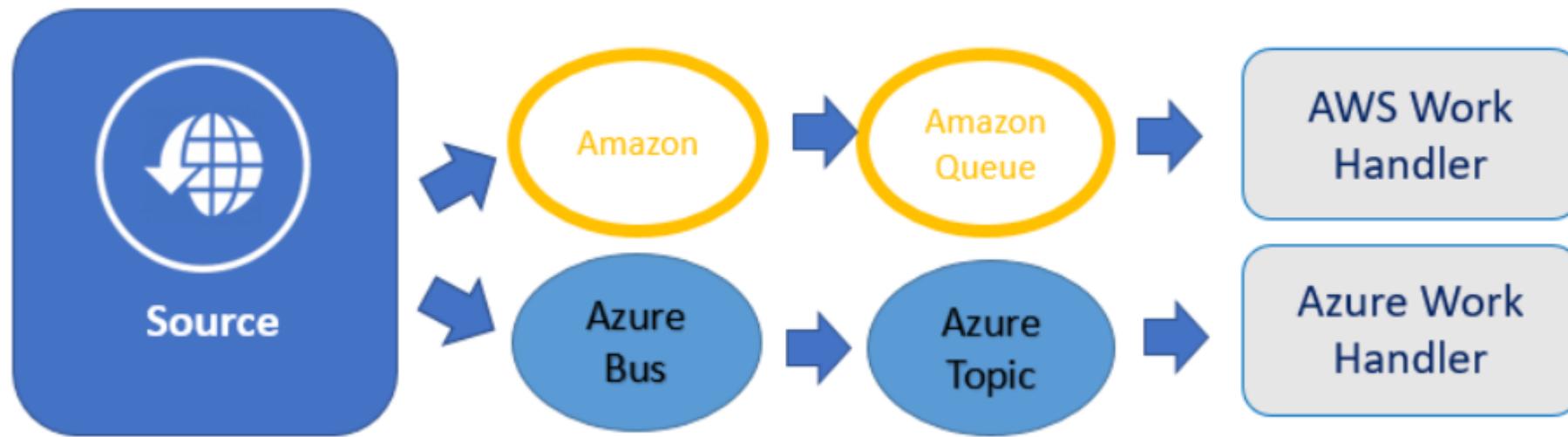


Figure 2-28. Dual-primed charge

Simple Workflow – Single Cloud Queues



Workflow – Dual Primary Cloud Queues





Hollywood Explosives



The Long Kiss Goodnight



VivaVideo



VivaVideo



3

3

4



3

3

4

*Fortunately programming and
hacking are always accurately
portrayed...*



Castle (s08e08)





© T



Planning





“A good plan violently executed now is better than a perfect plan executed next week.”

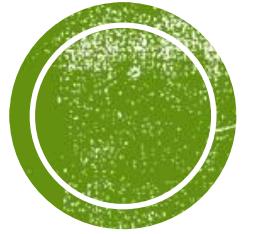
George S. Patton





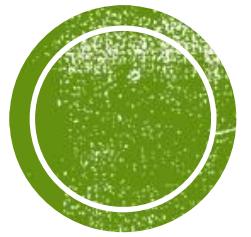
Proper Prior Planning Prevents Poor Performance

And Perfect Practice Makes Perfect



Hope is not a plan.

Related: When did you last verify you can actually recover your backups?



**Fail to Plan,
Plan to Fail**



“In preparing for battle I have always found that plans are useless, but planning is indispensable.”

Dwight D. Eisenhower





Backward Planning

Plan backward from fixed deadlines

Backward Planning Example

0900 Convoy departs

0845 Final checks and inspections

0830 Vehicles fueled and lined up

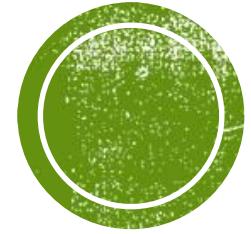
0800 Breakfast

0700 Load vehicles and equipment checks

0630 Leader meeting

0600 Wake-up and personal hygiene





**“No plan ever
survives contact
with the enemy.”**

Helmuth von Moltke the Elder



**Semper
Gumby!**

Always Flexible



“Adjust Fire”



Fire for Effect





Ready - Fire - Aim





Leadership





“Leadership is the art of getting someone else to do something you want done because they want to do it.”

Dwight D. Eisenhower





**When in Charge,
Take Charge**





“When placed
in command,
take charge.”

General Norman Schwarzkopf

Photo by Staff Sgt. Shejal Pulivarti





“The more you sweat in peace,
the less you bleed in battle.”

General Norman Schwarzkopf





**Leaders inspire and
influence people to
accomplish
organizational goals**

FM 6-22



**Followership is a
leadership quality.**



Lead by example

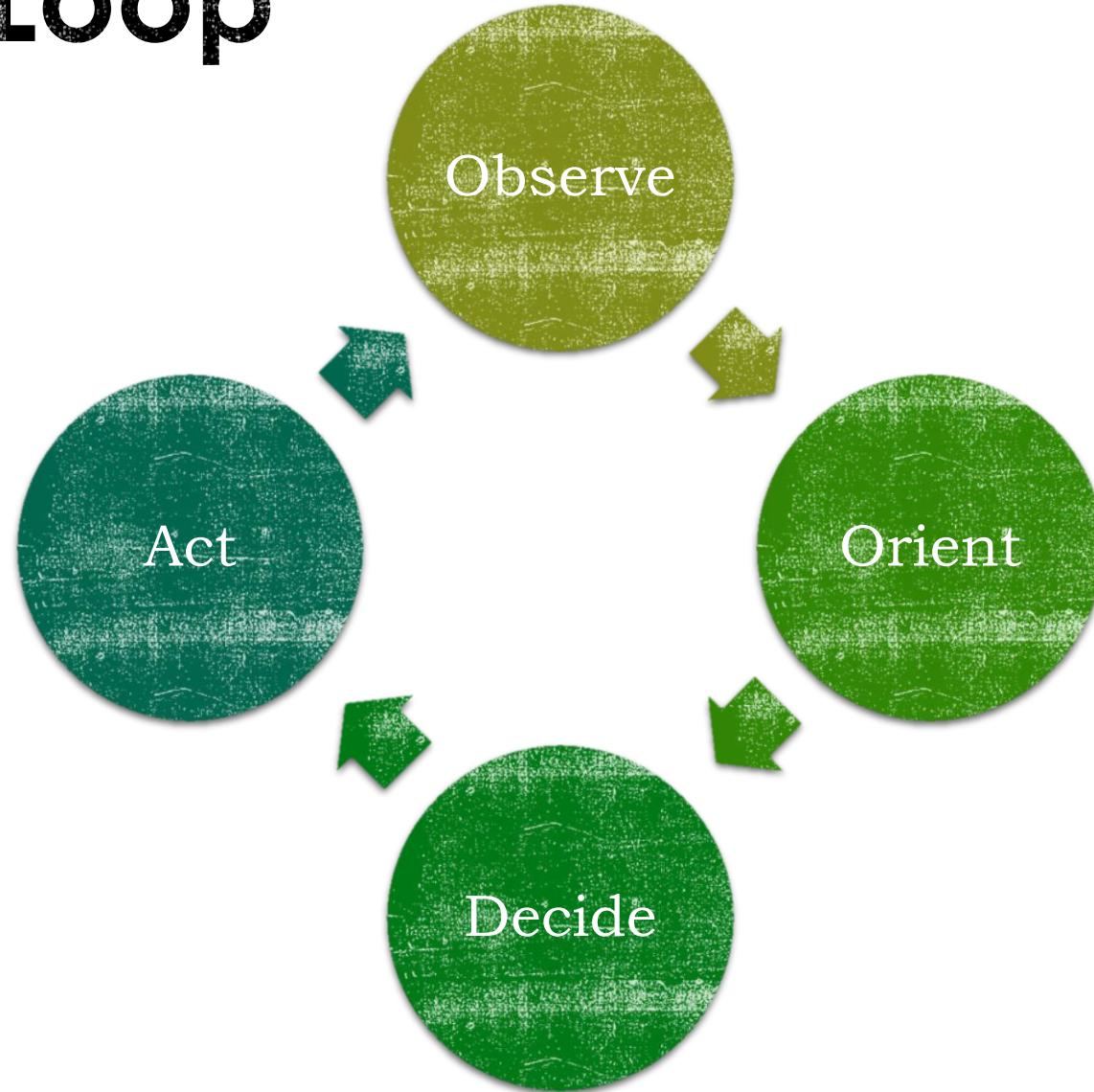


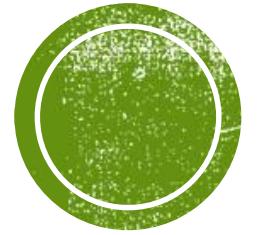


**Your actions reflect on
your organization.
Even off duty.**

How do you represent yourself and your organization?

OODA Loop





Take Care of Your Team



Taking Care of Your Team

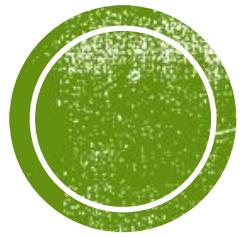
- Leaders arrive and are ready to go first/early
- They're last to leave when training completed
- Leaders eat after their team has been fed



Accept Responsibility; Share Credit

- Take responsibility for team failures
- Share credit for team successes
- Call out individuals who contributed to success
- Giving credit doesn't **detract** – it **enhances** respect for the leader



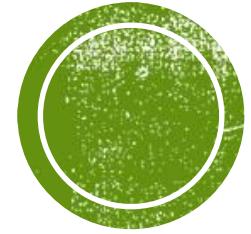


**Praise in public;
punish in private**



Uniformity and Standards





**Failure to enforce
the standard...
sets a new standard**



Standard Operating Procedures (SOPs)

IN CASE
OF DIRECT
FIRE HIDE
HERE



Effective Leaders

- Team is working on the right thing
 - And doing the work right
- Actively work to increase team productivity
 - And eliminate obstacles to it
- Attract and develop strong team members and leaders
- Minimize losses





“Sleep When You Can”

Army Proverb

You don't know when you'll next have the opportunity.



In Iraq

Waiting for our phase of an early morning raid



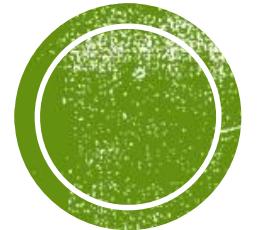


“You go to war with the army you have, not the army you might want or wish to have at a later time.”

Donald Rumsfeld



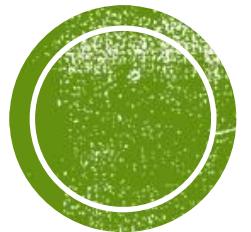




After Action Reviews

“Only training improves combat performance without imposing the stiff penalties combat inflicts on the untrained.”

Leader’s Guide to AARs

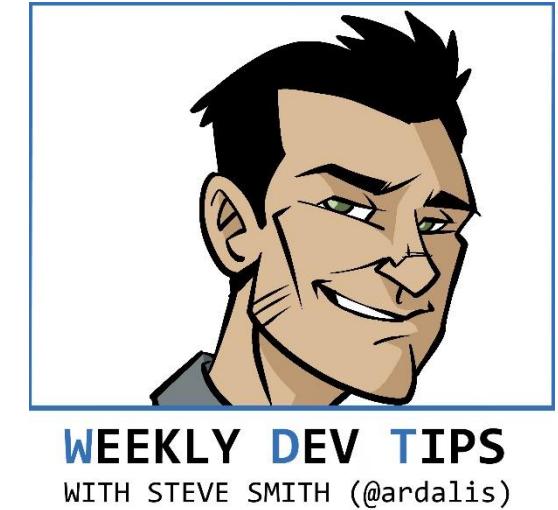


You're Good to Go!

Thanks! Any Questions?

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WEEKLY DEV TIPS
WITH STEVE SMITH (@ardalis)

