



Trigger Considerations

S. Luitz, SuperB Caltech Meeting

12/2010

[Shrimp in Cream Sauce over Pasta](#)

Ingredients

- * 1 lb / 500g raw shrimp, head-on
- * 3 cloves garlic, minced
- * 1 tbsp butter
- * 1 cup / 250ml dry white wine
- * 1 cup / 250ml water
- * 1/3 cup / 75ml heavy cream
- * 1 tbsp cognac
- * salt to taste
- * pinch of cayenne - to taste
- * pinch of saffron
- * ca. 1 tsp corn starch dissolved in a small amount of water
- * 1-2 tbsp parsley, coarsely chopped
- * salmon roe as garnish (optional)

Preparation

1. Peel and de-vein shrimp. Keep heads and shells.
2. Melt butter in a heavy pot over medium heat. Add shrimp heads and shells. Cook for a few minutes until fragrant, adjust heat so things don't burn. Add garlic, cook for 2-3 minutes.
3. Add dry white wine and water and bring to a simmer. Simmer gently for about 15 minutes. Slowly stir in heavy cream, simmer for another 10 minutes.
4. Strain through a fine sieve, press down on shrimp heads to extract as much of liquid and flavor as possible. Discard heads.
5. Bring the liquid to a simmer again, add saffron, and cayenne cook gently for another 2-3 minutes. Adjust seasoning with salt.
6. Remove from heat, slowly stir in cornstarch slurry, heat up again until the sauce thickens.
7. Place shrimp in sauce, heat up for a few minutes until fully cooked.
8. Serve over pasta, garnish with parsley and salmon roe (optional).

Baseline

- DCH+EMC in BaBar-like configuration
 - EMC improved segmentation
 - 2d map - but what granularity?
 - Higher sampling frequencies?
- Reasonable starting point
- Baseline needs to be validated!
- Improvements may be needed
- → Iteration with detector, trigger & DAQ design
 - e.g. do we *need* the SVT for the trigger?
 - Stereo layers in the DCH?
 - Front-end electronics in the EMC?
 - Do we need more bandwidth in the DAQ so that we can process data in the HLT
 - Does a Level-2 trigger help (not obviously)

Ingredients

- * 1 pork tenderloin
- * 2 tbsp vegetable oil
- * $\frac{1}{2}$ cup / 125ml vinegar
- * 2 oz / 60g sugar
- * juice and zest (thin strips) of 3 oranges
- * 1 cup / 250ml chicken stock
- * $\frac{1}{4}$ cup / 60 ml Grand Marnier
- * 1 small onion, finely chopped
- * 2 cloves garlic, minced
- * 4 oz / 125g sugar
- * 1 cup / 250ml water
- * 2 tbsp chopped fresh parsley
- * a few twigs of parsley as garnish
- * salt and pepper to taste

Preparation

1. Combine 4 oz / 125g sugar and 1 cup / 250ml water in a heavy saucepan and bring to a boil. Add the orange zest and simmer until about one half of the liquid is left. Strain, set aside the orange zest.
2. Preheat oven to 350°F / 175°C
3. Combine the vinegar and 2 oz / 60g sugar in a heavy saucepan. Set over medium heat, reduce until the mixture turns syrupy. Add orange juice and chicken stock.
4. Season the pork tenderloin with salt and freshly ground pepper. Set pan over high heat, add vegetable oil and cook the tenderloin until well browned from all sides. Remove from pan and set aside.
5. Reduce heat. Add onions and garlic to pan, cook until the onions are soft and translucent.
6. Add Grand Marnier, cook for a minute or two, then add the mixture of sugar, vinegar and orange juice. Return tenderloin to pan.
7. Cook tenderloin in the oven until the core temperature has reached 145°F / 63°C. Remove from oven, wrap in aluminum foil and let rest
8. Season the sauce with salt and pepper, add chopped parsley.
9. Slice the tenderloin. Garnish with orange zest and fresh parsley.

Validation

- Tools
 - BaBar data
 - Fast- or other simulation
 - L1 trigger simulation (missing)
 - Did not exist in general BaBar software

Ingredients

Starter

2 tbsp sourdough starter culture

3 1/3 oz / 100g bread flour

1/4 cup and 3 tbsp / 100ml water

Caramelized Onions

1 lb / 450g onions, chopped

1/2 cup / 125ml olive oil

2 tbsp sugar

1/2 tsp salt

1/2 cup / 125ml balsamic vinegar

2 tbsp water (for cooling down)

Bread Dough

3/4 lb / 350g bread flour

3 1/3 oz / 100g whole wheat flour

3 1/3 oz / 100g whole rye flour

2/3 cup / 180ml water

1/3 oz / 10g salt

1/2 tsp olive oil

corn meal

Preparation

Combine ingredients for the starter in a non-reactive bowl. Mix well, cover, let stand overnight until very active and bubbly.

Heat up large heavy skillet over medium-high heat. Add olive oil and onions. Cook until lightly browned, stir frequently to avoid scorching, adjust heat as necessary. This will take about 15-20 minutes.

Add the sugar, keep cooking until golden brown and caramelized. Stir frequently.

Add the balsamic vinegar, cook until liquid has evaporated.

Add the 2 tbsp water, let cool down, set aside.

Combine starter, bread flour, whole wheat flour, whole rye flour, salt and water in a stand mixer bowl. Add the caramelized onions (with the oil).

Knead with dough hook until dough becomes elastic and cleans the bowl (ca. 10-15 minutes).

Form a ball, coat with olive oil and let rise until volume has doubled.

Divide dough into 10 equal pieces (ca. 100g each).

Sprinkle a cutting board with cornmeal. Shape the rolls by rolling the dough pieces, pressing them with the palm of your hand against a flat surface. Place on the cutting board.

Cover with a damp kitchen towel. Let rise until volume has doubled. Preheat oven to 400°F / 200°C. I bake the rolls directly on a large baking stone, but a baking sheet (cover with baking paper) will work, too.

With a sharp knife, slash the rolls, be careful to not deflate the dough.

Transfer rolls to the baking stone or sheet in the oven, spray with water. Bake until done (20-30 minutes), spray with water a few times during the first 10 minutes.

Remove from oven, let cool before serving.

Yields 10 rolls.

Questions for Validation & Design

- Rates (Bhabhas, Irreducible, Backgrounds)
- Background suppression
- Trigger efficiencies & physics performance
- L1 accept rate
- Sampling frequencies?
- Time separation capability
 - Between subsequent triggers.
 - $O(100\text{ns})$ required if rate extrapolations are correct
 - Intrinsic per-channel dead-time \rightarrow overall trigger dead time
- Trigger jitter / time resolution
 - How would this compare to "offline"?

Latency

Ingredients

- * 36g / 1.2 oz salt
- * 600g / 1 lb 4 oz lean veal meat ("veal stew meat") at refrigerator temperature, cut into 1cm / $\frac{1}{2}$ in cubes
- * 300g / 10 oz lean pork meat, cut into 1cm / $\frac{1}{2}$ in cubes, partially frozen
- * 400g / 13 oz pork fat (pork belly without the skin, etc.) at refrigerator temperature, cut into 1cm / $\frac{1}{2}$ in cubes
- * 300g / 10 oz ice
- * 100g / 3 oz pork skin
- * 1g / $\frac{1}{2}$ tsp dried lemon peel
- * 1g / $\frac{1}{4}$ tsp MSG (optional)
- * 1g / $\frac{1}{4}$ tsp white pepper
- * pinch of dried ginger
- * pinch of freshly grated cardamom
- * pinch of dried mace
- * 10g / 0.3 oz onion (don't chop!)
- * 20g / 0.6 oz parsley, chopped
- * sausage casings (hog)

Preparation

1. Prepare casings per instructions (soak in warm water until pliable, rinse outside and inside). Set aside.
2. Bring 1l / 1 quart of water to a boil. Simmer pork skin and onion for ca. 15 minutes. Remove from water, run through meat grinder, set aside.
3. Combine lean meat (pork, veal), spices, salt and half of the ice. Blend in the food processor until you have a smooth farce. Set aside, refrigerate.
4. Blend pork fat in the food processor until smooth
5. Blend in lean meat farce.
6. Blend in remaining ice until the mixture is smooth and no ice clumps remain.
7. With the food processor mix in ground pork skin and parsley, blend just enough to distribute evenly.
8. Stuff 16 sausages using a sausage stuffer or a sausage stuffing attachment. Do not overstuff, when twisting the links, leave a little room for expansion in each link. If necessary, remove large air bubbles by piercing the casing with a skewer. Tie off the links.
9. In a large stock pot heat up water to 80°C / 175°F. Check with thermometer.
10. Place sausages in hot water, leave in for 30 minutes, adjust heat to keep temperature constant at 80°C. Check with thermometer.
11. Remove from hot water, place in cold water to cool. Refrigerate until ready to serve.
12. To serve, heat up with some fresh parsley in hot beef stock (or salted water). Do not boil.
13. Serve with fresh pretzels and sweet mustard.

Notes

- * You need a powerful food processor to prepare the stuffing in large batches. My 14-cup model with a direct drive works just fine. Be careful with smaller models with belt drives, they may not be powerful and sturdy enough and you may break the drive belt (I did that some 5 years ago)! If you have one of these, run the meat through a meat grinder first and process only very small batches.
- * For best results, use a dedicated sausage stuffer. Meat grinder attachments have the tendency to warm up the stuffing which may cause the fat-water emulsion to separate.

Potential Upgrades

- SVT in trigger?
 - Interaction with SVT technology choices!
- Move functions to software triggers
 - More complex analysis possible
 - E.g. true waveform fits
 - Need to get the data out

[Zwiebelkuchen](#)

Ingredients

For the crust

- * 1 lb 8oz / 600g flour
- * 5 tbsp / 75g butter, melted
- * 1 egg
- * 1 packet of active dry yeast. (See notes for my sourdough version)
- * 1 tsp salt
- * 1 tsp sugar
- * $\frac{1}{2}$ cup / 120ml water
- * $\frac{1}{2}$ cup / 120ml milk
- * 2 tbsp butter for the pans

For the topping

- * 3 lbs/ 1.5kg onions, sliced or coarsely chopped
- * 1 tbsp butter
- * 1 tbsp vegetable oil
- * 1 tsp salt
- * 2 tsp caraway seeds
- * $\frac{1}{2}$ - 1 tsp freshly ground pepper
- * $\frac{1}{2}$ cup dry white wine
- * 1 cup / 250ml heavy whipping cream
- * $\frac{1}{2}$ cup / 125ml sour cream
- * 5 eggs
- * 4 oz / 125g bacon, diced
- * 4 stalks of green onions, chopped
- * $\frac{1}{2}$ cup / 125ml milk
- * $\frac{1}{2}$ tsp white pepper, freshly ground
- * $\frac{1}{2}$ tsp salt
- * $\frac{1}{4}$ tsp nutmeg, freshly grated
- * pinch of cayenne pepper
- * 2 tbsp parsley, chopped

Preparation

Dough for the crust

1. Dissolve yeast in half of the milk.
2. Combine flour, yeast (or sourdough starter), 1 egg, sugar, salt, milk, milk with yeast, water and melted butter. Knead until the dough is smooth and elastic.
3. Form a ball, coat thinly with oil, let rise in a warm place until volume has about doubled.

Topping

1. In the meanwhile, heat butter and oil in a large heavy pan over high heat. Add caraway seeds. Add onions, 1 tsp salt and 1 tsp of pepper. Cook for about 15 minutes, stirring frequently and making sure the onions don't brown (turn down heat if necessary).
2. Add wine, cook for another 10 minutes until the liquid has evaporated. Set aside.

3. Whisk together cream, sour cream, eggs, pepper, nutmeg and salt. Add cayenne pepper and stir in chopped parsley. Set aside.

The Onion Cakes

1. Generously butter 2 large pizza pans, 1 tbsp of butter per pan.
2. Preheat oven to 375°F / 190°C
3. Divide dough into two equal parts. Stretch or roll out each part and put on a pizza pan. Spray with a bit of water or cover with damp cloth and let rise for another 15 minutes.
4. Top each pan with the onions, pour half of the egg-cream mixture on top and add the green onions and bacon.
5. Bake for ca. 30 minutes until the crust is golden brown and the egg-mixture has set. (It is easiest to bake both pans at the same time in an air circulation oven, alternatively, swap the pans from time to time between upper and lower rack.

High Level Triggers

- Less of a concern right now
 - We can throw CPU (or GPU / FPGA) time at the problem
 - Unless we go to the extremes of design space (e.g. L1-less design) cost increases should be moderate

ingredients

10oz / 300g peeled (raw) pearl onions
2 tbsp granulated sugar
2 tbsp olive oil
 $\frac{1}{4}$ tsp salt
2 tbsp white wine
freshly ground pepper (to taste)
pinch of dried rosemary

Preparation

Heat oil, sugar and rosemary in a heavy saucepan over medium-high heat. Stir frequently until the sugar is nicely browned (light coffee color). Add pearl onions and stir until well coated. Add white wine and a generous amount of ground black pepper (to taste). Cover, reduce heat and cook until the onions are soft and almost done. Take off lid and boil off remaining liquid.

Other Questions

- What's the spatial granularity we need for the trigger?
- Consider separate front-end electronics (shaping times, etc.) for trigger and main readout?
 - NOT!
 - Adding complexity to on-detector front-end electronics is **HIGHLY** undesirable!
- Interaction with DCH cluster counting option?

Ingredients

- * 1 pork tenderloin
- * 1 small onion, finely chopped
- * 1½ oz / 45g fresh ginger, finely chopped
- * 5 cloves garlic, peeled and finely chopped
- * 2 tsp vegetable oil
- * ¼ tsp salt
- * ¼ tsp finely grated lime zest
- * 1/8 tsp cayenne pepper
- * ¼ cup / 125ml dry white wine
- * ¼ cup / 60 ml water
- * juice of 1 lime
- * 3 tbsp / 45ml vegetable oil
- * 1 cup chopped fresh mint leaves
- * handful of cilantro, chopped
- * 1 lettuce, washed and leaves cut/ripped into bite-sized pieces
- * Cherry tomatoes and mushrooms for garnish
- * Salt to taste

Preparation

1. Set heavy pan over medium-high heat. Add vegetable oil. Brown tenderloin from all sides. Remove, set aside.
2. Add onion, cook until softened. Do not brown, reduce heat if necessary.
3. Add ginger, garlic and salt. Cook for a few minutes.
4. Add lime zest, white wine, cayenne and water. Return pork tenderloin to pan. Simmer covered until core temperature has reached 145°F / 63°C (ca. 15-20 minutes). Remove from pan wrap in aluminum foil and let rest while finishing the salad.
5. Turn off heat. Add lime juice, 3 tbsp of vegetable oil, mint leaves and cilantro. Adjust seasoning with salt. This is the dressing.
6. Toss the lettuce with the dressing.
7. Slice the tenderloin.
8. Serve the tenderloin on top of the salad. Garnish with sliced cherry tomatoes and finely sliced mushrooms.

[Pork Tenderloin on a Mint, Ginger and Garlic Salad](#)

Towards a TDR

- 1-2 FTE-years for validation and design
 - Mix of physicist & engineer time
 - Goal for TDR: High-level design with validated physics performance and good idea how to implement
- Description of 2 TRG jobs now in SuperB job list

Ingredients

For the Paella

2 lbs / 1kg meat (chicken and pork, see Notes), cut into 1in / 3cm pieces
3 cloves garlic, finely chopped
½ small onion
1 red, 1 green bell pepper, cut into strips
½ lb / 200g tomatoes, finely chopped
½ lb / 200g green beans (I usually use frozen)
12 large shrimp, tail-on, de-veined
6 large scallops
6 baby octopuses, cleaned
12 live clams or mussels, scrubbed
1 lb / 450g Arborio rice
2 tbsp olive oil
¼ tsp Saffron
Salt, Pepper (to taste)

For the stock

2 lbs / 1kg fish (see Notes)
1 small onion, finely chopped
2 cloves garlic, finely chopped
1 tbsp olive oil
1 stalk of celery, chopped
1 carrot, chopped
chicken bones, if available from the main recipe
1 cup / 250ml dry white wine
2 quarts / 2l water (or chicken stock, if available)
2 tsp salt (or to taste, adjust if you use chicken stock and it is salty)

Preparation

Stock

Set heavy saucepan on medium heat. Add olive oil and onions and cook until very lightly browned. Add garlic, carrot, celery and salt. Cook for another minute. Add fish (and optionally the chicken bones). Cook for a few more minutes. Add water (and/or stock) and dry white wine. Bring to a boil, cover, reduce heat and simmer for at least 45min, better 60-90min
Strain, retain the stock and discard the solids. Keep the stock hot.

Paella

Rub meats with freshly ground pepper (to taste)
Heat up 14in (36cm) Paella pan on the grill
Add the olive oil, then brown the meat from all sides. Remove meat from the pan and set aside.
Cook octopuses for ca. 30s. Remove, set aside.
Cook onions until translucent, add garlic, green beans and bell peppers. Cook for a few more minutes.
Add back the meat, add the rice, cook until the rice starts to become translucent.
Add tomatoes, cook for 2-3 minutes.
Add saffron to the hot stock, stir. Add the stock to the Paella pan.
Throw a few wood chips on the grill, set the grill to low heat (put on lid if possible) and simmer until the liquid has been almost absorbed (depends on heat, ca. 25min)
Stick the mussels into the rice, cook for ca. 3min. Put scallops and shrimp on top. Cook until almost done (2-4min). Add octopuses, cook for another minute or two so that they can heat up. Serve.

Notes

Flavorful fish is better for the stock. Fish heads work well. You can also add shrimp heads. Cheap fillets (e.g. tilapia) work too, but not as well (a little trick to intensify the flavor is to add 1 anchovy to the fish). For the meats I use equal parts of chicken thighs and not too lean pork (lean pork can get really dry and tough). I usually get bone-in chicken thighs, remove the bones and cook them with the stock.

Summary

- A lot of work to be done!
- Discussion, please 😊

[Frozen Blueberry Yogurt](#)

Ingredients

2 cups / ca. 250g frozen blueberries
¼ cup / 50g sugar
3 cups / 750ml low-fat yogurt
2 tsp lemon juice
1/8 tsp salt
6 leaves of lemon balm (or mint) as garnish

Preparation

Blend together all ingredients. There is no need to thaw the blueberries before blending.
Put in a bowl, place in the freezer.
Freeze, stir from time to time until almost completely frozen.
Serve very cold, top with a leaf of lemon balm.
Yields 6 servings