Subject: [PATCH 4/13] BC: context inheriting and changing
Posted by dev on Tue, 05 Sep 2006 15:19:40 GMT
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Contains code responsible for setting BC on task,
it's inheriting and setting host context in interrupts.

Task references 2 beancounters:
1. exec_bc: current context. all resources are
   charged to this beancounter.
3. fork_bc: beancounter which is inherited by
   task's children on fork

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```
 include/bc/task.h        |   57 +++++++++++++++++++++++++++++++++++++++++++++++++++
 include/linux/sched.h    |    5 ++++
 kernel/bc/Makefile       |    1
 kernel/bc/beancounter.c  |    3 ++
 kernel/bc/misc.c         |   31 +++++++++++++++++++++++++++
 kernel/fork.c            |    5 ++++
 kernel/irq/handle.c      |    9 ++++++++
 kernel/softirq.c         |    8 +++++++
 8 files changed, 119 insertions(+)

--- ./include/bc/task.h.bctask 2006-09-05 12:24:07.000000000 +0400
+++ ./include/bc/task.h 2006-09-05 12:38:53.000000000 +0400
@@ -0,0 +1,57 @@
+/*
+ *  include/bc/task.h
+ *
+ *  Copyright (C) 2006 OpenVZ. SWsoft Inc
+ *
+ */
+
+#ifndef __BC_TASK_H_
+#define __BC_TASK_H_
+
+struct beancounter;
+
+struct task_beancounter {
+	struct beancounter *exec_bc;
+	struct beancounter *fork_bc;
+};
+
```

```
+#ifdef CONFIG_BEANCOUNTERS
+
+#define get_exec_bc() (current->task_bc.exec_bc)
+
+#define set_exec_bc(new) ({    \
+  struct task_beancounter *tbc;  \
+  struct beancounter *old;  \
+  tbc = &current->task_bc;  \
+  old = tbc->exec_bc;   \
+  tbc->exec_bc = new;   \
+  old;     \
+ })
+
+#define reset_exec_bc(old, expected) do {  \
+  struct task_beancounter *tbc;  \
+  tbc = &current->task_bc;  \
+  BUG_ON(tbc->exec_bc != expected); \
+  tbc->exec_bc = old;   \
+ } while (0)
+
+void bc_task_charge(struct task_struct *parent, struct task_struct *new);
+void bc_task_uncharge(struct task_struct *tsk);
+
+#else
+
+#define get_exec_bc()   (NULL)
+#define set_exec_bc(new)  (NULL)
+#define reset_exec_bc(new, expected) do { } while (0)
+
+static inline void bc_task_charge(struct task_struct *parent,
+  struct task_struct *new)
+{
+}
+
+static inline void bc_task_uncharge(struct task_struct *tsk)
+{
+}
+
+#endif
+#endif
--- ./include/linux/sched.h.bctask 2006-09-05 11:47:33.000000000 +0400
+++ ./include/linux/sched.h 2006-09-05 12:33:45.000000000 +0400
@@ -83,6 +83,8 @@ struct sched_param {
 #include <linux/timer.h>
 #include <linux/hrtimer.h>

+#include <bc/task.h>
+
```

```
 #include <asm/processor.h>

 struct exec_domain;
@@ -1041,6 +1043,9 @@ struct task_struct {
 #ifdef CONFIG_TASK_DELAY_ACCT
  struct task_delay_info *delays;
 #endif
+#ifdef CONFIG_BEANCOUNTERS
+ struct task_beancounter task_bc;
+#endif
 };

 static inline pid_t process_group(struct task_struct *tsk)
--- ./kernel/bc/Makefile.bctask 2006-09-05 12:10:05.000000000 +0400
+++ ./kernel/bc/Makefile 2006-09-05 12:24:39.000000000 +0400
@@ -5,3 +5,4 @@
 #

 obj-y += beancounter.o
+obj-y += misc.o
--- ./kernel/bc/beancounter.c.bctask 2006-09-05 12:16:50.000000000 +0400
+++ ./kernel/bc/beancounter.c 2006-09-05 12:24:07.000000000 +0400
@@ -247,6 +247,9 @@ void __init bc_init_early(void)
  spin_lock_init(&bc_hash_lock);
  slot = &bc_hash[bc_hash_fn(bc->bc_id)];
  hlist_add_head(&bc->hash, slot);
+
+ current->task_bc.exec_bc = get_beancounter(bc);
+ current->task_bc.fork_bc = get_beancounter(bc);
 }

 void __init bc_init_late(void)
--- /dev/null 2006-07-18 14:52:43.075228448 +0400
+++ ./kernel/bc/misc.c 2006-09-05 12:30:57.000000000 +0400
@@ -0,0 +1,31 @@
+/*
+ * kernel/bc/misc.c
+ *
+ * Copyright (C) 2006 OpenVZ. SWsoft Inc.
+ *
+ */
+
+#include <linux/sched.h>
+
+#include <bc/beancounter.h>
+#include <bc/task.h>
+
+void bc_task_charge(struct task_struct *parent, struct task_struct *new)
```

```
+{
+ struct task_beancounter *old_bc;
+ struct task_beancounter *new_bc;
+ struct beancounter *bc;
+
+ old_bc = &parent->task_bc;
+ new_bc = &new->task_bc;
+
+ bc = old_bc->fork_bc;
+ new_bc->exec_bc = get_beancounter(bc);
+ new_bc->fork_bc = get_beancounter(bc);
+}
+
+void bc_task_uncharge(struct task_struct *tsk)
+{
+ put_beancounter(tsk->task_bc.exec_bc);
+ put_beancounter(tsk->task_bc.fork_bc);
+}
--- ./kernel/fork.c.bctask 2006-09-05 11:47:33.000000000 +0400
+++ ./kernel/fork.c 2006-09-05 12:30:38.000000000 +0400
@@ -48,6 +48,8 @@
 #include <linux/delayacct.h>
 #include <linux/taskstats_kern.h>

+#include <bc/task.h>
+
 #include <asm/pgtable.h>
 #include <asm/pgalloc.h>
 #include <asm/uaccess.h>
@@ -104,6 +106,7 @@ static kmem_cache_t *mm_cachep;

 void free_task(struct task_struct *tsk)
 {
+ bc_task_uncharge(tsk);
  free_thread_info(tsk->thread_info);
  rt_mutex_debug_task_free(tsk);
  free_task_struct(tsk);
@@ -979,6 +982,8 @@ static struct task_struct *copy_process(
  if (!p)
   goto fork_out;

+ bc_task_charge(current, p);
+
 #ifdef CONFIG_TRACE_IRQFLAGS
  DEBUG_LOCKS_WARN_ON(!p->hardirqs_enabled);
  DEBUG_LOCKS_WARN_ON(!p->softirqs_enabled);
--- ./kernel/irq/handle.c.bctask 2006-09-05 11:47:33.000000000 +0400
+++ ./kernel/irq/handle.c 2006-09-05 12:24:07.000000000 +0400
```

```
@@ -16,6 +16,9 @@
 #include <linux/interrupt.h>
 #include <linux/kernel_stat.h>

+#include <bc/beancounter.h>
+#include <bc/task.h>
+
 #include "internals.h"

 /**
@@ -171,6 +174,9 @@ fastcall unsigned int __do_IRQ(unsigned
  struct irq_desc *desc = irq_desc + irq;
  struct irqaction *action;
  unsigned int status;
+ struct beancounter *bc;
+
+ bc = set_exec_bc(&init_bc);

  kstat_this_cpu.irqs[irq]++;
  if (CHECK_IRQ_PER_CPU(desc->status)) {
@@ -183,6 +189,8 @@ fastcall unsigned int __do_IRQ(unsigned
    desc->chip->ack(irq);
   action_ret = handle_IRQ_event(irq, regs, desc->action);
   desc->chip->end(irq);
+
+  reset_exec_bc(bc, &init_bc);
   return 1;
  }

@@ -251,6 +259,7 @@ out:
  desc->chip->end(irq);
  spin_unlock(&desc->lock);

+ reset_exec_bc(bc, &init_bc);
  return 1;
 }

--- ./kernel/softirq.c.bctask 2006-09-05 11:47:33.000000000 +0400
+++ ./kernel/softirq.c 2006-09-05 12:38:42.000000000 +0400
@@ -18,6 +18,9 @@
 #include <linux/rcupdate.h>
 #include <linux/smp.h>

+#include <bc/beancounter.h>
+#include <bc/task.h>
+
 #include <asm/irq.h>
 /*
```

```
    - No shared variables, all the data are CPU local.
@@ -209,6 +212,9 @@ asmlinkage void __do_softirq(void)
  __u32 pending;
  int max_restart = MAX_SOFTIRQ_RESTART;
  int cpu;
+ struct beancounter *bc;
+
+ bc = set_exec_bc(&init_bc);

  pending = local_softirq_pending();
  account_system_vtime(current);
@@ -247,6 +253,8 @@ restart:

  account_system_vtime(current);
  _local_bh_enable();
+
+ reset_exec_bc(bc, &init_bc);
 }

 #ifndef __ARCH_HAS_DO_SOFTIRQ
```